

amply represented in the herbarium. Although there are Old World species resembling B. texana, such as B. ammannioides Roth (indumentum different, flowers smaller, seeds about half the length) and B. serrata Blanco (pedicels longer), none was found identical with it. B. arenarioides (Cambess. ex St. Hil.) Fenzl was first described in 1829 from a collection by Saint-Hilaire "in paludosis prope vicum Salgado, in parte deserta occidentalique provinciae Minas Geraes." As far as could be learned, there is no report of a second collection. Niedenzu, who apparently examined a specimen, placed the species in a monotypic subsection. B. arenarioides is illustrated in St. Hilaire's Flora Brasiliae Meridionalis and in Martius' Flora Brasiliensis. It is a small radicant hairy resin-scented herb with long-pedicelled single axillary flowers and smooth seeds.

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#### MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. II

Harold N. Moldenke

##### VITEX AGNUS-CASTUS L.

Additional literature: W. L. Phillips, Cat. Pl. Fairchild Trop. Gard. 41, 46, & 47. 1949.

In reference to the Standley collection of this species in Dona Ana County, New Mexico, in 1906, a letter received by me from Professor E. F. Castetter, dated January 31, 1955, states that in 27 years of botanical collecting in New Mexico he has never yet seen this species in that state.

Additional citations: CULTIVATED: Alabama: Hassan s.n. [Jefferson Co., July 1939, originally from Palestine] (Ba); Mohr s.n. [Pascacoula, June 28, 1890] (W--771905). Argentina: Stuckert 15585 (Cb), 18637 (Cb). Austria: Ehrhard 266 (Vu); Fenz s.n. [H. B.V.] (V); Herb. d'Aline s.n. [Lamotte, Vienne, 1839] (N); Sennholz s.n. [Vienna, 9/1894] (V). Barbados: Waby 115 (B). Belgium: Herb. Brux. s.n. (Br); Herb. Jardin Mercier s.n. (X); Lejeune s.n. [H. Leod.] (Br). Bermuda: Brown, Britton, & Wortley 1742 (N). Brazil: Elack 48-3635 (Be--38092). British Guiana: Parker s.n. (K). California: Eard s.n. [Sept. 1, 1929] (Du--193741); Bradbury s.n. [Letts, Hollywood, 7/15/1916] (Ba); Burt Davy s.n. [Berkeley, Sept. 25, 1899] (Ca--41692); Condit s.n. [June 14, 1910] (Ca--454851); Demaree 9272 (A, Au, Bt--17214, E--1063702); W. R. Dudley s.n. [2 Nov. 1904] (A, Du--215323); Eastwood s.n. [San Francisco, Oct. 1913] (Gg--31477), s.n. [Hollywood High School, Aug. 1915] (Gg--31477); H. M. Hall s.n. [Botanic Garden, Berkeley, Oct. 1902] (Ar--19753); Roxford s.n. [Fresno, Oct. 1914] (A, Gg--31479); Walther 361 (N); C. B. Wolf 1407 (Rs--11098). Canada: Inglis s.n. [30 Sept. 1916, Ontario] (Ba). Cuba:

Acufia 19033 (Es); L. Gonzalez 16332 (Es, N). District of Columbia: A. C. V. S. Schott s.n. [U. S. P. garden] (F--43018); Seaman s.n. [Ag. grounds] (W--787601). Dominican Republic: Ekman H.15916 (B, N, S). Egypt: Vernleup s.n. [Oct. 14, 1880] (N). England: Herb. Bentham s.n. (Ed); Herb. Linnaeus G.811, S.4 (Ls--type, N--photo of type, Z--photo of type). Florida: H. H. Hume s.n. [Orlando, June 4, 1930] (Ba), s.n. [Gainesville, 25 May 1935] (Fl--21141); McFarlin 5571 (I); O'Neill 1558 (I), s.n. [Orlando, June 4, 1930] (I); Rolfs s.n. [Lake City, May 24, 1894] (Ga); Sargent s.n. [Key West, May 26, 1898] (A); G. F. Weber s.n. [Gainesville, 6-30-32] (Fl--21142). France: Bourdote s.n. [Aboulins, 25 sept. 1891] (Ol); Herb. Harvey s.n. [h.R.P. 1844] (Du--166543); Herb. Hort. Bot. Paris s.n. [10 aug. 1781] (V), s.n. (Cp, Cp); Herb. Jewett s.n. [Perpignan] (Mi, Mi); Herb. N. Y. Economic Mus. 6046 (N); Herb. Schreber s.n. (Mu--605); B. Maire s.n. [Jardin Botanique, 1894] (La). Georgia: Cuthbert s.n. [June 20, 1900] (Fl--21138); B. B. Higgins s.n. [Griffin, 6/4/35] (Ga); "J. H. M." E.1059 (Up); Mrs. Thompson s.n. [streets of Smithville] (E--788743). Germany: Baenitz s.n. [Städ. Bot. Gart. Breslau, 15.9.1910] (Ba, It, S, Ur, Ur); Herb. Hort. Acad. Halensis s.n. (B); Herb. Hort. Bot. Berol. s.n. (B); Herb. Hort. Erlangen s.n. (Mu--606); Herb. Will-ich & Weiss s.n. (B); Rettig s.n. [Koehne 321] (B, Cb, Cp, Go, Mu--3895, S, Us, Vu); Zabel 1 (Ur), s.n. [30.VIII.1895] (Ba). Guadeloupe: Duchassaing s.n. (P); Duss 4201 (B, N); Quentin 63 (P). Illinois: E. E. Green s.n. [Sept. 10, 1935] (Ba); W. F. Wight 980 (Ar--19751). India: Gupta s.n. [Dehra Dun Herb. 42323] (S); Raizada 85 (N). Italy: Herb. Götting. s.n. (Mi); Herb. Harvey s.n. [cult. in hort. ital. 1813] (Du--166539); Mori 800 (Ms), s.n. [Agosto 1933] (Se--69274); Vignolo-Lutati s.n. [6.IX.1938] (N). Java: Herb. Lugd.-Bat. 908267-207 (Le). Kansas: Beach s.n. [September & October 1927] (Ob--50380); Clothier s.n. [Manhattan, Aug. 5, 1895] (Ka); Gates 14235 (Ka--69481, Mi), 15026, in part (Mi); Herb. Kans. State Agr. Coll. s.n. [July 20, 1901] (Mi, Mi). Louisiana: Langlois s.n. [St. Martinville, June 1879] (I); Penfound & McCormick s.n. [Nov. 15, 1940] (Tl). Maryland: Dowell 6525 (W--640462). Massachusetts: Dawson s.n. [Arnold Arb., Sept. 1, 1883] (Ba); Herb. Arnold Arb. s.n. [Sept. 26, 1913] (A); Rehder s.n. [Arn. Arb., Oct. 12, 1898] (E--116139). Mississippi: Hocking s.n. [July 2, 1948] (N); Pierce s.n. [H. N. Moldenke 7586] (N). Missouri: J. A. Drushel 4205 (E--860644, Ur); Fendler s.n. [cult. M. B. G. 1861] (E--898979); Herb. Missouri Bot. Gard. 132772 (E), s.n. [Meehan's, 3/28/96] (E--116064); J. H. Kellogg s.n. [Sept. 20/06] (E--879119, Gg--130795), s.n. [July 8/21] (E--905007); Robbins s.n. [Macon, 15 Oct. 1920] (G). Netherlands: Abeleven s.n. (Le, N--photo, Z--photo); Herb. Lugd.-Bat. 908267-238 (Le), 908267-248, in part (Le). New Jersey: Guyot s.n. [Prince-

ton] (Pr). New York: Hartling s.n. [N. Y. Bot. Gard. Cult. Pl. 38788] (N); Herb. Brooklyn Bot. Gard. 4110 (Ba); Horsey s.n. [Highland Park, Oct. 2, 1917] (Ba); H. N. Moldenke 4078 (N); Nash s.n. [N. Y. Bot. Gard. Cult. Pl. 3576] (N, N); New York Coll. Agr. Herb. Cult. Pl. s.n. [Sept. 9, 1899] (It); L. S. Slater s.n. [August 24, 1922] (Al); Sparrow s.n. [Moldenke & Moldenke 11905] (N); R. S. Williams s.n. [N. Y. Bot. Gard. Cult. Pl. 26155] (N); S. H. Wright s.n. [Candia] (Mi). North Carolina: Biltmore Herb. 1786 [fls., July 27, 1897; fr., Sept. 27, 1896] (A, Ca--139754, E--116147, F--347225, J, J, Mi, N, Ur, Vt, W--332106); Manning s.n. [Biltmore, June 26, 1894] (Ba), s.n. [Biltmore, July 13, 1894] (Ba); P. O. Schallert 9 (Bt--9882), s.n. [Winston-Salem, 7/25/26] (Vt), s.n. [7/10/27] (Gg--200876, Hp), s.n. [7/1/31] (Or--28351), s.n. [7/5/31] (Hp). Oklahoma: Brodell 44 (Ob--34689); O. H. Calvert 150 (St--24300); H. Long 35 (St--9284); Prewett 88 (Bt--48572); Stratton 5565 (N); I. Watkins 27 (Id). Pennsylvania: C. E. Smith 76 (D). Peru: A. Mathews 404 (Em, Br, Ed, K); Soukup 2930 (N). Russia: Herb. Institut. Bot. Acad. Sci. U.R.S.S. s.n. (N). Saint Thomas: C. A. Ehrenberg 105 (B). Scotland: Herb. Univ. Edinb. s.n. (Ed). South Carolina: D. S. Martin s.n. [Columbia] (J); T. Noisette s.n. [Caroline] (P). Southern Nigeria: Dalziel 1248 (K); Dawodu 9 (K). Southern Rhodesia: Olyphant s.n. [Govt. Herb. Salisbury 2241] (Rh). Spain: Hort. Thenensis ser. 1842 s.n. (Br). Surinam: Wullschlägel 1054 (Br). Sweden: Herb. Mus. Bot. Stockholm s.n. (S). Switzerland: Herb. DeCandolle s.n. (Ol); Herb. Heldreich s.n. [Hort. Genev. 1839] (B); Herb. Jard. Bot. Genève. s.n. [25 Sept. 1935] (Cb, Cb, Cb, Cb). Tennessee: Bechtel 10981 (It); Jennison s.n. [U. T. campus, June 27, 1931] (Hs). Texas: C. C. Albers 32019 (Au), 41003 (Au); L. H. Bailey s.n. [Austin, July 22, 1918] (Ba); Bogusch 172 (Ur); Clemens & Clemens 960 (Ba, Po--69587), 962 (Po--69584); Dapprich 8468 (Sm); G. L. Fisher 1724 (W--719783); G. Jermy 163 (E--116137, E--116138), 588 (E--140930), s.n. (N); Lundell & Lundell 9351 (Mi, N), 9352 (Ld, Mi, N); Metz s.n. [Bexar Co., October 15, 1935] (I); C. M. Parker 4809 (Au); Reeves 40 (Ba), 195 (Cs); R. Runyon 4258 (N, Ug); Shaffer s.n. [July 12, 1950] (Ur); I. Shiller 870 (Au); Shinners 8582 (Sm); Studhalter 4130 (Au); Tharp s.n. [Austin, 8/20/41] (Sm); J. L. White 4738 (Au). West Indies: Von Rohr s.n. (Cp). LOCALITY OF COLLECTION UNDETERMINED: Bonaparte s.n. (Br); J. N. Buek 4629 [Fergestem] (La); Chaubard s.n. [Moice, 1868] (Br); Doyrolle s.n. [Europe merid.] (Fn--1664); Forbes s.n. [Siplanto Isl., Aug. 1841] (Ca--330214); Herb. Casström s.n. (S); Herb. Commons s.n. [Europe] (Cm); Herb. Mus. Hac. Hist. Nat. 16033 (Sg); Herb. Osbeck s.n. (S); Herb. Rottböll s.n. (Cp); Herb. Thévenau s.n. [Juillet 1867] (Br); Herb. Univ. Texas s.n. (Au); Moll s.n. [1834] (Br); Piré s.n. [Zasiminem, Septembre 1863] (Br); Rothman s.n. [Gareau]

(S). MOUNTED ILLUSTRATIONS: Addisonia 1: pl. 18 (N); Fig. 6 (N), 1313 (N), 8666 (N).

VITEX AGNUS-CASTUS f. ALBA (West.) Rehd., Bibl. Cult. Trees 584. 1949.

Literature: Castelli, Hort. Mess. 24. 1640; Cupani, Hort. Cathol. Suppl. Alt. 6. 1697; West., Bot. Univ. 1: 311--312. 1770; Carr., Rev. Hort. 1870: 415. 1871; L. H. Bailey, Cycl. Am. Hort. 4: 1947. 1902; L. H. Bailey, Stand. Cycl. Hort. 6: 3481. 1917; Rehd., Man. Cult. Trees, [ed. 1], 777. 1927; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Rehd., Man. Cult. Trees, ed. 2, 805 & 994. 1940; Moldenke, Prelim. Alph. List Invalid Names 49. 1940; Moldenke in Lundell, Fl. Texas 3 (1): 82. 1942; Moldenke, Alph. List Invalid Names 51 & 52. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 5, 75, & 102. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 1 & 23. 1947; Moldenke, Phytologia 2: 168. 1948; Moldenke, Wrightia 1: 245--246. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 10, 25, 165, & 200. 1949; Rehd., Bibl. Cult. Trees 584. 1949; Moldenke, Phytologia 3: 283, 284, 294 & 378. 1950.

Synonymy: Vitex flore albo Cast., Hort. Mess. 24. 1640. Agnus castus flore albo Cup., Hort. Cathol. Suppl. Alt. 6. 1697. Vitex agnus castus 2. alba West., Bot. Univ. 1: 311. 1770. Vitex agnus-castus var. flore albo Tornabene, Atti Accad. Gioenia Sci. Nat. Catania, ser. 2, 16: 119 & 125. 1860. Agnus castus vulgaris alba Carr., Rev. Hort. 1870: 415. 1871. Vitex agnus-castus var. alba Hort. ex Rehd. in L. H. Bailey, Cycl. Am. Hort. 4: 1947. 1902. Vitex albiflora Hort. ex Rehd. in L. H. Bailey, Cycl. Am. Hort. 4: 1947, in syn. 1902. Vitex agnus-castus var. alba Rehd. in L. H. Bailey, Stand. Cycl. Hort. 6: 3481. 1917. Agnus-castus vulgaris alba Carr. ex Rehd. in L. H. Bailey, Stand. Cycl. Hort. 6: 3481, in syn. 1917. Vitex agnus-castus alba West. ex Rehd., Man. Cult. Trees, ed. 2, 805 & 994. 1940. Vitex agnus-castus var. alba West. ex Moldenke, Prelim. Alph. List Invalid Names 49. 1930. Vitex alba Berckmans ex Moldenke, Prelim. Alph. List Invalid Names 49, in syn. 1940. Vitex agnus-castus var. albiflora Haptröm, in herb.

This form differs from the typical form of the species in having white corollas. It has been collected in flower from June to August and in fruit from August to October. Dr. Bailey, in his unpublished list of dealers handling Verbenaceae, states that it is offered by the Jungle, Princeton, and Sanford dealers.

Citations: FLORIDA: Highlands Co.: McFarlin 6475 (Mi). TEXAS: Travis Co.: McKee & Wesley 3896 (Au). JUGOSLAVIA: Herzegovinia: Murbeck s.n. [10/7/1889] (S). SYRIA: Haptröm s.n. [8/6/1932] (S). CULTIVATED: Massachusetts: Wilberding s.n. [Herb. Arnold Arb. 21358] (Ba), s.n. [Herb. Arnold Arb. 21358a] (Ba). District of Columbia: Tidestrom 544 (E--716942), 1085 (Ar--19752). Georgia: L. H. Bailey s.n. [Berckmans, Augusta 1917] (Ba).

VITEX AGNUS-CASTUS var. CAERULEA Rehd. in L. H. Bailey, Cycl. Am. Hort. 4: 1947 [as "Hort."]. 1902.

Literature: Zannich., Opusc. Posth. 21. 1730; Tornabene, Atti Accad. Gioenia Sci. Nat. Catania, ser. 2, 16: 119. 1860; L. H. Bailey, Cycl. Am. Hort. 4: 1947. 1902; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 82. 1942; Moldenke, Alph. List Invalid Names 51. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 102. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; Rehd., Bibl. Cult. Trees 584. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 100, 165, & 200. 1949; Moldenke, Phytologia 3: 378. 1950; Moldenke, Phytologia 4: 68. 1952.

Synonymy: Vitex foliis angustioribus Cannabis instar dispositis floribus caeruleis Zannich., Opusc. Posth. 21. 1730. Vitex floribus caeruleis Zannich. apud Tornabene, Atti Accad. Gioenia Sci. Nat. Catania, ser. 2, 16: 119. 1860. Vitex agnus-castus var. caerulea Hort. ex Rehd. in L. H. Bailey, Cycl. Am. Hort. 4: 1947. 1902. Vitex agnus-castus var. caerulea L. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Vitex agnus castus var. caerulea Hort. ex G. L. Fisher, Am. Bot. Exchange List, n.p. 1946. Vitex agnus-castus var. caerulea Hort. ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947.

This variety differs from the typical form of the species in having blue or pale-blue (not lilac) corollas. It is said to be a shrub to 2 meters tall, flowering in July. Couch found it as an escape at the side of a road in a vacant lot, growing in sandy loam, in Dallas County, Texas, and reports that there was a "peculiar odor present". Joor found it "adventive" in Saint Bernard Parish, Louisiana. Rehder, in the reference cited above, reduced the variety to synonymy under the typical form of the species, probably because so many people are not able to distinguish between blue and lilac.

Citations: LOUISIANA: Saint Bernard Par.: Joor s.n. [July 29, 1887] (Tl). TEXAS: Dallas Co.: A. B. Couch 23 (Ur). URUGUAY: Rosengurt B.3631 (N). ITALY: Bruni s.n. [Barletta, 1844] (S). CULTIVATED: North Carolina: P. O. Schallert 5 (N), 351 (Ur), s.n. [7/20/40] (Hp, Pl--125206), s.n. [6/20/41] (Au).

VITEX AGNUS-CASTUS f. LATIFOLIA (Mill.) Rehd., Journ. Arnold Arb. 20: 415. 1939.

Literature: Mill., Gard. Dict., ed. 8, no. 2. 1768; West., Univ. Bot. 1: 311--312. 1770; DC. & Lam., Fl. Franç. 2: 363. 1778; Duham., Traité Arbres & Arbust., ed. 2, 6: 115. 1812; Loud., Encycl. Pl. 520. 1829; Loud., Arb. Brit. 3: 1286. 1838; Schau. in A. DC., Prodr. 11: 684. 1847; Tornabene, Atti Accad. Gioenia Sci. Nat. Catania, ser. 2 [Fl. Foss. Etna], 122--126, pl. 3, fig. A'. 1860; Carr., Rev. Hort. 1870: 416. 1871; Horticulture, ser. 2, 5: 350. 1927; B. R. Slade, Horticulture, ser. 2, 8: 552. 1930; Brooklyn Bot. Gard. Record 22: 7. 1933; Horticulture, ser. 2, 11: 290. 1933; Moldenke, Geogr. Distrib. Avicenn.

40. 1939; Rehd., Journ. Arnold Arb. 20: 415 & 428. 1939; Moldenke, Prelim. Alph. List Invalid Names 49, 51, & 52. 1940; Rehd., Man. Cult. Trees, ed. 2, 805. 1940; Moldenke, Am. Midl. Nat. 24: 753--754. 1940; Moldenke, Suppl. List Invalid Names 10 & 12. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 102. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 82. 1942; Journ. N. Y. Bot. Gard. 43: 36, 37, & 43. 1942; Moldenke, Alph. List Invalid Names 51 & 53--55. 1942; Wisler, Swarthmore Pl. Notes, ed. 2, 1: 217. 1942--1943; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; N. Y. Herald Trib., sect. 5, p. 17, June 27, 1948; Stump & Walter, Seed Annual for 1948: 26. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 165 & 200. 1949; Moldenke, Anal. Inst. Biol. Mexico 20: 15. 1949; Rehd., Bibl. Cult. Trees 584. 1949; Moldenke, Phytologia 3: 378 & 379. 1950; Stump & Walter, 1950 Garden Annual 81. 1950; P. Henderson, Autumn Planting Guide 17. 1950; Moldenke, Phytologia 3: 454. 1951; Kelly Bros., 1951 Garden Book 45. 1951; Moldenke, Phytologia 4: 199. 1953; N. Y. Herald Trib., sec. 4, p. 16, Aug. 23, 1953.

Illustrations: Tornabene, Atti Accad. Gioenia Sci. Nat. Catania, ser. 2 [Fl. Foss. Etna], pl. 3, fig. A'. 1860; Horticulture, ser. 2, 5: 350. 1927; Horticulture, ser. 2, 8: 552. 1930; Horticulture, ser. 2, 11: 290. 1933; Journ. N. Y. Bot. Gard. 43: 37. 1942; Stump & Walter, Seed Annual for 1948: 26. 1948; Stump & Walter, 1950 Garden Annual 81. 1950; Kelly Bros., 1951 Garden Book 45. 1951.

Synonymy: Vitex latifolia Mill., Gard. Dict., ed. 8, no. 2. 1768. Vitex agnus-castus var. latifolia West., Univ. Bot. 1: 311-312. 1770. Vitex agnus-castus var. latifolia alba West., Univ. Bot. 1: 311--312. 1770. Vitex verticillata DC. & Lam., Fl. Franç. 2: 363. 1778. Vitex agnus-castus var. latifolia Mill. ex Duham., Traité Arbres & Arbust., ed. 2, 6: 116. 1812. Vitex agnus-castus var. latifolia Loud., Encycl. Pl. 520. 1829. Vitex agnus castus var. latifolia Loud., Arb. Brit. 3: 1286. 1838. Vitex agnus castus var. latifolia (Mill.) Tornabene, Atti Accad. Gioenia Sci. Nat. Catania, ser. 2 [Fl. Foss. Etna], 122--126, pl. 3, fig. A'. 1860. Agnus castus robusta Carr., Rev. Hort. 1870: 416. 1871. Vitex macrophylla Anon., Horticulture, ser. 2, 5: 350. 1927. Vitex agnus-castus var. macrophylla Hort. ex Brooklyn Bot. Gard. Record 22: 7. 1933. Vitex negundo var. macrophylla Moldenke, Geogr. Distrib. Avicenn. 40, nom. nud. (1939), Am. Midl. Nat. 24: 753--754. 1940. Vitex verticillata Lam. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. Vitex agnus-castus var. fossilis Moldenke, Prelim. Alph. List Invalid Names 49, hyponym. 1940. Vitex macrophylla Hort. ex Rehd., Man. Cult. Trees, ed. 2, 805, in syn. 1940. Vitex agnus-castus var. latifolia Tornabene ex Moldenke, Prelim. Alph. List Invalid Names 49, in syn. 1940. Vitex agnus-castus var. latifolia (Mill.) Loud. ex Moldenke, Am. Midl. Nat. 24: 754. 1940. Vitex agnus-castus latifolia Tornabene ex Moldenke, Alph. List Invalid Names Suppl. 1:

28, in syn. 1947. Vitex agnus-castus var. latifolia (Mill.)  
Tornabene ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in  
syn. 1947.

This form differs from the typical form of the species in being hardier and more vigorous and in its densely many-flowered cymes, mostly simple panicles about 3.5 cm. wide during anthesis, larger flowers, and more uniformly large, oblong-lanceolate, and broad (to 2.5 cm. wide) leaflets which are 3--7 in number. It is a well-shaped shrub and the inflorescences tend to stand out divergently from the shrub. Even young plants not more than a foot tall may be expected to produce a few terminal flower-clusters on the new wood. The leaves are silver-green or grayish and are often described as "star-shaped" by gardeners because of their palmate nature. The variety is not well-marked botanically, however, and tends to grade into the typical form of the species. The white-flowered condition may be worthy of special form designation.

When grown where it is fully hardy it may grow as much as ten feet tall and become almost as broad as tall, but farther north (above New York City, for instance) it makes a much shorter annual growth from the base after freezing back during the winter. Even when it does not die back to the ground, gardeners recommend that it be cut back to ground level in the early spring. This tends to produce a neat-appearing, shorter, and mostly bushy growth. From late June through August and even September it produces terminally on the growth of that season very showy lilac, lavender-blue, deep lavender-blue, blue, or purple [or white] panicles of flowers. In August it usually attains its full glory -- at a time when few other shrubs are in bloom. It thrives best in a light sandy soil in full sunlight. It was formerly rare in American gardens, but now so many nurserymen offer it that it has become the commonest cultivated form. It is best suited for lawns or shrubby borders. It has been collected in flower in December and January in tropical climes and in the Southern Hemisphere. Fruiting specimens have been obtained in October. Common names recorded for it are "chaste-tree", "rare chaste-tree", and "vitex"

It has been found in the fossil form in Recent strata on or near Mount Etna in Italy.

Rehder in Journ. Arnold Arb. 20: 428 (1939), Duhamel in his Traité Arbres et Arbustes, ed. 2, 6: 115--116 (1812), and others are of the opinion that the "Vitex latiore folio" of C. Bauhin, Pinax Theatr. Bot. 475 (1671), is a synonym of this form. However, this name seems to be based on the Vitex latiore serrato folio of L'Obel, Pl. Stirp. Icon. 2: 139 (1531) and the Agnus folio serrato of J. Bauhin, Hist. Pl. Univers. 1 (6): 205 (1650) and both these names refer more properly to var. serrata Moldenke. The same applies to the plant referred to by Loiseleur, Nouv. Duham. 6: 116 (1813), as cited by Rehder, which has the leaflets only occasionally with a few teeth near the apex.

Dr. Bailey lists the following commercial sources for f. latifolia: Bay State, Bobbink & Atkins, Brooklyn Botanic Garden,

Cape Cod, Craig, Dreer, F. Gillet, McFarland, Michell, Outpost, Princeton, Sanford, Siebenthaler, Somerset, and Wayside. Two-to-three-foot plants sell for from 85 cents to \$1.25 each, 3 plants for \$2.25 to \$3.50, and a dozen for \$13.75.

A second label on the United States National Herbarium sheet of Mohr s.n., cited below, is inscribed "cultivated, Mobile, June 1897", but it is not certain that this pertains to the specimen on the sheet.

Citations: FRANCE: Beaudouin s.n. [18/4/1886] (S); Loiseleur s.n. [Toulon] (S). SPAIN: Sennen s.n. (S). AUSTRIA: Hagdahl s.n. [Wien] (S). ITALY: Herb. Lus. Bot. Stockholm s.n. (S); Watova s.n. [Olhy, IX.922] (Br). SICILY: Babington s.n. [Messina, 1845-1851] (C). CORSICA: C. F. Nyman s.n. [13 Aug. 1860] (S). JUGO-SLAVIA: Fiume: "R. M. S." s.n. [August 1864] (Br). MOROCCO: Evans s.n. (S); Quer 545 (S). ALGERIA: Piré s.n. [Algerie] (Br). TURKEY: Callier 171 (S). CULTIVATED: Massachusetts: C. E. Cross s.n. [8/12/36] (Ms); Rehder s.n. [Herb. Arnold Arb. 15613/435-22] (A, N--photo, Z--photo). New York: L. H. Bailey s.n. [Aug. 26, 1923] (Ba), s.n. [Sept. 5, 1929] (Ba); H. N. Moldenke 21251 (Hw, Le, Lm, Z). North Carolina: Mohr s.n. [Asheville, July 1900] (H), s.n. [Asheville, July 1910] (W--771902). California: McClintock s.n. [July 14, 1943] (La); Walther 174 (Ba, Ba, N--photo, Z--photo), 361 (A). Puerto Rico: Britton & Britton 9417 (H). Saint Thomas: V. A. Miller s.n. [Nelthropp 9] (H). Uruguay: Lombardo 7530 (H). LOCALITY OF COLLECTION UNDETERMINED: Herb. Swartz s.n. (S).

VITEX AGNUS-CASTUS var. PSEUDO-NEGUNDO Hausskn. in Bornm., Pl. Strauss. 3: 117 [as "Agnus Castus"]. 1907.

Literature: Bornm., Pl. Strauss. 3: 117. 1907; Hand.-Mazz., Ann. Hofmus. Wien 27: 408. 1913; Moldenke, Phytologia 2: 29--30. 1941; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Alph. List Invalid Names 52 & 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 102 (1942) and [ed. 2], 124 & 200. 1949; Moldenke, Phytologia 3: 295 & 379 (1950), 3: 454 & 460 (1951), and 4: 74. 1952.

Synonymy: Vitex pseudo-negundo (Hausskn.) Hand.-Mazz., Ann. Hofmus. Wien 27: 408. 1913. xVitex hybrida Moldenke, Phytologia 2: 29--30. 1941. Vitex pseudo-negundo Hand.-Mazz. ex Moldenke, Alph. List Invalid Names 54, in syn. 1942. Vitex agnus-castus var. pseudo-negundo (Hausskn.) Bornm. ex Moldenke, Suppl. List Invalid Names 1, in syn. (1941); Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 102. 1942.

I am in doubt about the correct accreditation of this trinomial and its place of publication. According to Handel-Mazzetti in the reference cited above, his binomial V. pseudo-negundo is based on "Vitex agnus castus var. pseudo-negundo Hausskn. in Bornm., Pl. Strauss. 3: 117 (1907)". Thus far, however, I have been unable to find this reference. The Index Kewensis also



accredits the trinomial to Haussknecht, but without place of publication cited. I am grateful to botanical colleagues and librarians in various institutions for their help in attempting to locate this elusive trinomial's original publication.

The taxon here being discussed has had a checkered history to date. In my 1941 supplement, cited above, I reduced it to synonymy under V. agnus-castus L., while in my 1942 Alph. List Invalid Names I regarded it as a true species. Meanwhile, in *Phytologia* 2: 29--30 (1941) I proposed the name xVitex hybrida for what I then supposed to be a natural hybrid between V. agnus-castus and V. negundo L. It was based on an unnumbered specimen collected by Bhole in Sind, Pakistan, in July, 1891. I now feel that this specimen represents what is currently called V. agnus-castus var. pseudo-negundo. The characters of this variety are more or less intermediate between those of V. agnus-castus and V. negundo, as was pointed out by Handel-Mazzetti, but it appears to grow mostly where one of the supposed parents does not occur. V. agnus-castus, in its typical form, is a Mediterranean plant, found wild from Portugal and Spain through southern France, Italy, Corsica, Sardinia, Sicily, the Balearic, Ionian, and Aegean Islands, Cyprus, Crete, Malta, Jugoslavia, and Greece, north to southern Germany and Hungary, east to Transcaucasia, Turkmanaskaya, and Sind, and south through Turkey, Syria, Iraq, Lebanon, and Israel to Morocco and Algeria. It has been introduced and naturalized in Natal, the southeastern United States, and elsewhere.

V. negundo, on the other hand, is found from the Northwestern Provinces of Pakistan, India, and Ceylon, through parts of China, Japan, Formosa, Hongkong, Hainan, the Lantau Islands, Annam, Cambodia, Malacca, and Penang, to the Philippines, Java, Sarawak, the Lesser Sunda Islands, and Guam; also in Mauritius and Madagascar, but probably there introduced.

The so-called var. pseudo-negundo is known from Turkmanaskaya and Turkey through Syria and Israel and east to Iran, Afghanistan, Baluchistan, and Sind. It is apparent, therefore, that the variety does not occur naturally anywhere with both supposed parents, although usually with one or the other. Eig, Feinbrun, & Zohary are of the opinion that it is a "sub-Irano-Turanian plant, penetrating into the Mediterranean region. We are somewhat in doubt," they say on a large printed label, "about the specific value of the plant, which is closely related to V. agnus-castus, although it presents very distinct differential characters, such as a bearded lower lip and smaller corollas. Although the area of this species and that of V. agnus-castus partly overlap, we consider V. pseudo-negundo an Irano-Turanian plant, penetrating into the Mediterranean region, whereas V. agnus-castus is a plant of the Mediterranean element penetrating into the Irano-Turanian region. In Palestine we found V. pseudo-negundo from the Shefela and from different places in the Jordan Valley (both Upper and Lower). V. agnus-castus was found by us in the Sharon, in the Judean mountains, and in the Upper Galilee.

The habitat of V. pseudo-negundo is banks of watercourses, where it is a principal plant of the Viticetum pseudo-negundi. We have encountered this association (or one approaching it in composition), with V. pseudo-negundo as the principal species, along rivers and wadies in Iraqi Kurdistan." It flowers in July and is a favorite host plant for the dodder, Cuscuta viticis Hand.-Mazz.

Citations: UNION OF SOCIALIST SOVIET REPUBLICS: Turkmanakaya: Regel s.n. [VII-VIII. 1382] (Br). TURKEY: Sintenis 1305 (S). ISRAEL: Amdursky 280 (Bt--41046, Go, N, N--photo, Z--photo); Eig 280 (Gg--234155); Eig, Feinbrun, & Zohary 280 (S); Feinbrun s.n. [6.6.49] (N, N, Ug), s.n. [between Kefar Aba and Birwa, 6.6.49] (N, N, Ug), s.n. [7.6.49] (N, Ug); Jouannet-Marie 60 (Du); Meyers & Dinsmore B.8172 (S); Samuelsson 645 (S); E. Wall 49 [6/532] (Ew, N), 49 [27/432] (Ew). LEBANON: Gombault 4009 (S). IRAN: K. H. Rechinger 1308 (S). AFGHANISTAN: Griffith 6059 (S). BALUCHISTAN: Harsukh 20615 (V--10518). PAKISTAN: Sind: Bhola s.n. [July 1891] (Mi, N--photo, Z--photo). INDIA: State undetermined: Herb. Coll. Pharmacy s.n. [Lukkur] (Pa).

VITEX AGNUS-CASTUS var. PSEUDO-NEGUNDO f. ALBIFLORA Moldenke, Phytologia 4: 59. 1952.

Literature: Moldenke, Phytologia 4: 59 & 74. 1952.

This form differs from the typical form of the species in having white corollas. It is known thus far only from the type collection made by Dinsmore near water at Jesr-ul-Ghajir, at an altitude of 160 meters, in the Dead Sea region of Israel, on September 24, 1921.

Citations: ISRAEL: Dinsmore 172f (N--photo of type, S--type, Z--photo of type).

VITEX AGNUS-CASTUS f. ROSEA Rehd., Journ. Arnold Arb. 20: 427--428. 1939.

Literature: Rehd., Journ. Arnold Arb. 20: 427--428. 1939; Rehd., Man. Cult. Trees, ed. 2, 805. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 82. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 102. 1942; Moldenke, Phytologia 2: 348. 1947; Moldenke, Wrightia 1: 246. 1948; Rehd., Bibl. Cult. Trees 584. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 165 & 200. 1949; Moldenke, Phytologia 3: 378. 1950.

Synonymy: Vitex macrophylla rosea Chenault ex Rehd., Journ. Arnold Arb. 20: 428, in syn. 1939. Vitex macrophylla var. rosea Hort. ex Moldenke, Suppl. List Invalid Names 11, in syn. 1941.

This form differs from the typical form of the species in having pink corollas and broader leaflets approaching those of f. latifolia in size. It has been collected in anthesis in June. The type was collected by A. T. Sanford at Sanford Arboretum, Knoxville, Tennessee, on July 16, 1938, and is deposited in the herbarium of Arnold Arboretum at Jamaica Plain, Mass. Another

specimen cited by Rehder is Herb. Arnold Arb. 402-37, received from Chenault at Orleans, France, in 1937, under the name of "Vitex macrophylla rosea". The type collection is said to be originally from the same source.

Citations: ITALY: Bruni s.n. [1844] (S). SARDINIA: Collector undesignated s.n. [1841] (Br). CULTIVATED: Texas: Lundell & Lundell 9351 (Ld).

VITEX AGNUS-CASTUS var. SERRATA Moldenke, Geogr. Distrib. Avicenn. 40, nom. nud. (1939); Am. Midl. Nat. 24: 753. 1940.

Literature: L'Obel, Pl. Stirp. Icon. 2: 139. 1581; J. Bauhin, Hist. Pl. Univers. 1 (6): 205. 1650; C. Bauhin, Pinax Theatr. Bot. 475. 1671; Duham., Trait e Arbres & Arbust., ed. 2, 6: 115--116. 1812; Loisel., Nouv. Duham. 6: 116. 1813; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Rehd., Journ. Arnold Arb. 20: 428. 1939; Moldenke, Am. Midl. Nat. 24: 753. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 102. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 82. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 165 & 200. 1949.

Synonymy: Vitex latiore serrato folio L'Obel, Pl. Stirp. Icon. 2: 139. 1581. Agnus folio serrato J. Bauhin, Hist. Pl. Univers. 1 (6): 205. 1650. Vitex latiore folio C. Bauhin, Pinax Theatr. Bot. 475. 1671.

This variety differs from the typical form of the species in having its leaflets rather distinctly serrate when mature, although sometimes the serrations are rather irregular or are confined to near the apex of the leaflet-blades. Young leaves have the teeth rather obscure.

The type was collected from a cultivated plant in the Hort. Bot. Noviomagensis [Nijmegen, Holland] by H. A. J. Abeleven and is mounted on a sheet in the Leiden herbarium along with material of the typical form of the species. The Royen collections agree well with the type, but have the teeth more irregular or more obscure. Their labels do not specify that they were taken from cultivated plants, but since they are from the Netherlands, I assume that they were in cultivation there.

Rehder in Journ. Arnold Arb. 20: 415 & 428 (1939) is of the opinion that the plants described by L'Obel, C. Bauhin, J. Bauhin and Loiseleur are f. latifolia (Mill.) Rehd., but in my estimation they belong, rather, to var. serrata. L'Obel's figure shows the leaflets coarsely serrate, while Loiseleur's figure shows only a few teeth occasionally near their apex.

Citations: CULTIVATED: Netherlands: Abeleven s.n. (Le--903267-217--type, M--photo of type, Z--photo of type); Royen s.n. (Le--903267-243, in part, Le--903267-253, N). Germany: Rehder s.n. [Bot. Gard. Jena, Aug. 1905] (Ur).

VITEX AJUGAEFLORA Dop, Bull. Soc. Hist. Nat. Toulouse 57: 202. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 202. 1928; Hill, Ind. Kew. Suppl. 9: 297. 1938; Moldenke, Alph. List Invalid

Names 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59, 75, 80, & 102 (1942) and [ed. 2], 137, 165, & 200. 1949.  
 Synonymy: Vitex ajugiflora P. Dop ex Hill, Ind. Kew. Suppl. 9: 297, sphalm. 1938.

This species is based on Poilane 6844 and Pierre 1509 as co-types. Pierre describes it as a tree 30 meters tall, cultivated at Saigon.

Citations: CULTIVATED: Indochina: Pierre 1509 (N--cotype).

VITEX ALTISSIMA L.f., Suppl. Pl. 294. 1781.

Literature: L.f., Suppl. Pl. 294. 1781; Willd., Gesell. Naturforsch. Freund. Berlin, Neue Schr. 4: 203. 1803; Wall., Numer. List no. 1755. 1829; Roxb., Fl. Ind. 3: 71. 1832; Blanco, Fl. Filip., ed. 1, 516. 1837; Steud., Nom. Bot., ed. 2, 2: 777. 1840; Schau. in A. DC., Prodr. 11: 685. 1847; Wight, Icon. Pl. Ind. Orient. 4: pl. 1466. 1849; Miq., Fl. Ind. Bat. 2: 861. 1856; Drury, Useful Pl. India 442. 1858; Dals. & Gibs., Bombay Fl. 201. 1861; Thwaites, Enum. Pl. Zeyl. 246. 1864; Birdwood, Cat. Veg. Prod. Bomb. 335. 1865; Beddome, Fl. Sylv. pl. 252. 1872; Brandis, For. Fl. NW. & Cent. India 3: 370. 1874; Ind. Forester 3: 23, 178, & 204 (1877) and 4: 338. 1878; Gamble, Man. Ind. Timb. 297. 1881; Ind. Forester 8: 29 (1882) and 10: 31 & 33. 1884; Rep. For. Admin. Ch. Nagpur 33. 1885; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 584. 1885; Ind. Forester 12: 551. 1886; Watt, Dict. Econom. Prod. India 6 (4): 247. 1893; Trimen, Handb. Fl. Ceylon 3: 357. 1895; H. Hallier, Meded. Rijks Herb. Leiden 37: 44. 1918; H. J. Lam, Verbenac. Malay. Arch. 369 & 371. 1919; Journ. Agr. Univ. Porto Rico 20: 133 & 626. 1936; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 50--52. 1940; Moldenke, Suppl. List Common Names 1--3, 9, 14, 15, 19, & 20. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55, 56, 67, 75, & 102. 1942; Moldenke, Alph. List Invalid Names 52--55. 1942; H. F. MacMillan, Trop. Plant. & Gard., ed. 5, 197, 214, 216, & 217. 1943; Moldenke, Phytologia 2: 118. 1944; Razi, Journ. Mysore Univ. 7 (4): 64. 1946; Menninger, Introduct. Offer Flower. Tree Coll. [1]. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 128, 130, 149, 165, & 200. 1949; Razi, Journ. Mysore Univ. 11 (2): 54. 1950.

Illustrations: Wight, Icon. Pl. Ind. Orient. 4: pl. 1466. 1849; Beddome, Fl. Sylv. pl. 252. 1872.

Synonymy: Vitex appendiculata Willd., Gesell. Naturforsch. Freund. Berlin, Neue Schr., 4: 203. 1803 [not V. appendiculata Rottl., 1885]. Vitex altissima Roxb. ex Wall., Numer. List no. 1755, hyponym. 1829. Vitex pubescens Heyne ex Wall., Numer. List no. 1755, in syn. 1829 [not V. pubescens Vahl, 1794]. Vitex latifolia Wight ex Steud., Nom. Bot., ed. 2, 2: 777. 1840 [not V. latifolia Mill., 1768, nor Lam., 1788, nor Blanco, 1837]. Vitex altissima Moon, Cat. Indig. Exot. Pl. Ceylon 46. 1824. Vitex trifolia Moon apud Trimen, Handb. Fl. Ceylon 3: 357. 1895 [not V. trifolia L., 1753]. Vitex altissima Heyne, in herb. Vitex altissima L., in herb.

Large tree, to 10 m. tall, with a dense head and somewhat drooping branches; wood gray, with a tinge of olive-brown, hard, close-grained, heavy, with a weight of 50--63 pounds per cubic foot; branchlets medium-slender, very obtusely tetragonal or subterete, gray, glabrate; twigs slender, medullose, mostly sharply tetragonal and decussately flattened, dark-brown or purplish, rather densely short-pubescent when young, becoming sparsely strigillose in age, the pubescence brownish; nodes on young twigs mostly annulate with a ridge and a band of denser pubescence, on older branchlets more obscurely annulate with a transverse line; principal internodes 2.5--5 cm. long; leaves decussate-opposite, 3-foliolate; petioles rather slender, 4.5--10.5 cm. long, angulate, convex or keeled beneath, flattened above, slightly margined for the entire length, usually somewhat more pronouncedly so at the apex and base, rather densely puberulent or shortly strigillose-pubescent, more sparsely so in age, not pronouncedly ampliate at the base (except for the margins); leaflets subequal in size or the central one slightly larger, the central one subsessile or petiolulate with slightly margined petiolules 1--3 mm. long, the lateral ones usually subsessile or with obscure margined petiolules to 1 mm. long; leaflet-blades thin-chartaceous, dark-green above, somewhat lighter beneath, the central one elliptic or subobovate-elliptic, 10--20 cm. long, 3--6.7 cm. wide, acuminate or caudate at the apex, entire or slightly repand-undulate along the margins, acute or subacuminate at the base, rather densely puberulent above when young, becoming glabrous (except for the midrib) in age, varying from densely short-pubescent beneath to pulverulent and resinous-granular and strigillose only on the larger venation; midrib slender, flat or subimpressed above, prominent beneath; secondaries slender, 12--17 per side, arcuate-ascending, running to the very margin but not anastomosing or else arcuately joined near the margins, flat above, prominulent beneath; vein and veinlet reticulation very delicate, often obscure, sometimes subprominulent on both surfaces; inflorescence axillary and terminal, paniculate, 15--23 cm. long, 3--24 cm. wide, sometimes simple or few-branched, often massive with 3--5 pairs of widely divergent or arcuate-ascending branches; peduncle 1.5--4 cm. long, it and the rachis similar to the young twigs, decidedly tetragonal and flattened, puberulent or short-pubescent and more or less incanous; axial sympodia 2--4 cm. long, plainly annulate at each node; panicle-branches very slender, ascending, often arcuate, the lowermost longest, diminishing in length upwards, each with a rather long naked stalk and then 2--10 rather distant pairs of subsessile densely flowered cymes; pedicels obsolete; bracts apparently caducous; bractlets and prophylla narrowly oblong, acute at both ends, sessile, 1--5 mm. long, densely short-pubescent with incanous or cinereous pubescence; corolla (according to Carr) cream-colored, the lip white.

The two specimens collected by Norman Taylor differ from the typical form of the species in being glabrous on the upper surface of the leaflets (except for the midrib) and only pulverulent

and resinous-granular and strigillose on the larger venation beneath. The petioles are also more elongate. These specimens, however, are obviously taken from sterile shoots on plants forced in a greenhouse and may therefore be regarded as somewhat abnormal and unrepresentative. These and the other New York specimens cited below are from plants raised from seed secured from the Calcutta Botanical Garden.

Razi calls the species a megaphanerophyte according to the classification of life-forms by Raunkiaer. Its timber is one of the most valuable in southern India, being smooth, tough, durable and reasonably immune to the attacks of termites. It does not split nor warp, polishes well, and is much used for building purposes, for cabinet work, and for making carts, especially their wheels. It has been found from sea-level to altitudes of 4000 feet. According to Hohenacker it blooms in the rainy season. Carr found it in Papua on open river-flats at sea-level, blooming in February. Watts describes it as a large tree of Bengal, southern India, and Ceylon, especially common in western India. MacMillan asserts that it is a good tree to plant along sea-coasts or in moderately dry regions in low country in the tropics and that it is "common in the dry low-country of Ceylon".

Vernacular names recorded for it are "ahay", "balgay", "banalgay", "gua", "kadamanakku", "maila", "milla", "millilla", "myrole", "namilí adogú", "nauladi", "sampaga-pala", "sapu-milla" and "simyanga".

Herbarium specimens have been misidentified as V. alata Heyne, V. limonifolia Wall., V. negundo L., and V. pubescens Vahl.

In the Linnean Herbarium sheet number 2 under genus 811 [790] is inscribed "altissima" in the handwriting of the younger Linnaeus and bears a ticket inscribed "Vitex altissima. Foliis ternatis integerrimis. Pedunculis subalatis. Paniculis dichotomis maximis. Baccis trispermi. Mail. Elou. Hort. Malab. P. V. Pag. 1, tab. 1. Habitat in vastis sylvis Zeylonae. König 77". This ticket is all in the handwriting of the younger Linnaeus, according to E. D. Jackson. The specimen is very pubescent on the under surface of its leaflets, the leaves are 3-foliolate, and the petiole is but very slightly winged. This specimen is apparently the actual type specimen of V. altissima. Sheet number 3, however, is apparently var. alata (Willd.) Moldenke.

Willdenow, in the reference cited above, which is an article by him on plants collected by Rottler, gives the name V. appendiculata to a plant collected in "Madras in horto Andersoniano. Octobr. 15. 1799" and this seems undoubtedly to be V. altissima. The Rottler specimen cited below may actually be an isotype of V. appendiculata Willd. He plainly states that this plant is distinct from his V. alata, based on a Roxburgh specimen with "petiolus communis bipollicaris et ultra alatus" (whereas V. appendiculata has "petiolis basi appendiculatis").

Vitex altissima has been recorded from the Philippines and trees 44 to 76 cm. in diameter of trunk have even been illustrated from Molave under this name. Miquel and Schauer, in the ref-

erences cited above, cite specimens from "Luzon" and "Manila". Actually, however, all the Philippine records seem to represent the "V. altissima Blanco" and "V. altissima Naves" and are actually V. parviflora A. L. Juss. Lam quotes Hallier as asserting definitely that the true V. altissima does not occur in the Philippines, but only in "British India". The tree referred to by Menninger in the reference cited above and actually seen by me in 1954 is var. alata.

Vitex altissima in its typical form is said to be cultivated in Puerto Rico and there to be infested by the insect Saissetia oleae Bernard, but all the specimens seen by me thus far from that island prove actually to be var. zeylanica (Turcz.) C. B. Clarke.

The Wight illustration cited above is dated "1850" by Hallier in Meded. Rijks Herb. Leiden 37: 44 (1918). The species is said to be referred to also in Lisboa, Useful Pl. Bombay 108, Gribble, Man. Cuddapsh. 262, and the Gazetteer Bombay 15: 40 & 87.

Citations: PAKISTAN: East Bengal: Griffith 6066 (V). INDIA: Bombay: Hohenacker 115 (N, S, S); Stocks, Law, et al. s.n. [Malabar, Concan] (Er, N, S). Madras: Jeshoda 184 (N); Narayanawamy 18851 (N); G. Thomson s.n. [Mont. Nilghiri & Kurg.] (M, S). Mysore: Meebold 9640 (S). State undetermined: Rottler s.n. (Cp, N--photo, Z--photo); Schuman 56 (Cp); Vahl s.n. (Cp); R. Wight 2325 [Aramallay] (S, S), s.n. [Peninsula Ind. Orientalis] (N). CEYLON: König 77, in part (Ls--type, N--photo of type, Z--photo of type); J. M. de Silva 185 (Er, N). NEW GUINEA: Papua: Carr 11315 (N). CULTIVATED: New York: Hartling s.n. [N. Y. Bot. Gard. Cult. Pl. 10128] (Ur); N. Taylor s.n. [N. Y. Bot. Gard. Cult. Pl. 10128] (N, N). India: Wallich 184 (Cp). Java: Herb. Hort. Bogoriense XI.K.6 (Bz--25835, Bz--25854, Bz, Bz, N), s.n. [from Peredenia garden] (Bz--23797, Bz--23798, N), s.n. [Archip. Ind.] (Bz--25034, Bz--25035).

VITEX ALTISSIMA var. ALATA (Willd.) Moldenke, Revist. Sudam. Bot. 5: 2. 1937.

Literature: Rheede, Hort. Ind. Malab. 5: 1--2, pl. 1. 1685; Adans., Fam. Pl. 2: 12 & 200. 1763; Roth, Nov. Pl. Sp. 316. 1821; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 584. 1885; Trimen, Handb. Fl. Ceylon 3: 358. 1895; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 49 & 50. 1940; Moldenke, Alph. List Invalid Names 52. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55, 75, & 102. 1942; Menninger, Introduct. Offer Flow. Tree Coll. [1]. 1946; Razi, Journ. Mysore Univ. 7 (4): 64. 1946; Menninger, 1947 Cat. Flow. Trees 25. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 16. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 128, 165, & 200. 1949; Menninger, 1953 Cat. Flow. Trees 16. 1953; Menninger, 1955 Price List, n.p. 1954.

Illustration: Rheede, Hort. Ind. Malab. 5: pl. 1. 1685.

Synonymy: Mail-elou Rheede, Hort. Ind. Malab. 5: 1--2, pl. 1. 1685. Mailelou Rheede ex Adans., Fam. Pl. 2: 12 & 200. 1763. Vitex alata Willd., Gesell. Naturforsch. Freund. Berlin, Neue Schr., 4: 203. 1803. Vitex alata Heyne ex Roth, Nov. Pl. Sp. 316. 1821. Vitex appendiculata Rottl. ex C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 584, in syn. 1885. Vitex altissima var. alata (Heyne) Trimen, Handb. Fl. Ceylon 3: 358. 1895. Vitex alata Royen ex Moldenke, Prelim. Alph. List Invalid Names 49, in syn. 1940. Vitex spathulata H. J. Lam, in herb.

This variety differs from the typical form of the species in having its petioles more or less broadly alate from the apex to the base and the leaflets mostly quite sessile, often irregularly dentate or serrate on juvenile forms, and glabrate on both surfaces (except for the midrib above). The leaflets are sometimes 1-foliolate on juvenile forms. The wings on the petioles are 3--8 mm. wide from the apex to near the base; at the base they often widen out much more and clasp the twig or branchlet.

Rheede describes the flowers as odorous, insipid, borne in panicles near the extremities of the branches, the corolla with one large lobe which is blue inside and bluish-white outside and 4 smaller lobes which are whitish outside and pale-greenish inside, purplish toward the base. Trimen states that the plant inhabits low country, principally in the dry region, and is common in Ceylon, occurring also in peninsular India, blooming from July to October. He describes the flowers as very pale violet or white, with the middle lobe of the lower lip bluish. The tree is said to be taller and straighter than typical V. altissima. It is a valuable timber tree, the wood being hard, tough, heavy, close-grained, smooth, durable, and gray. Carpenters distinguish several varieties. The bark is used as a fomentation in rheumatic swellings and the wood affords a yellow dye. I am, however, not certain that all these statements apply only to the variety and not to the species in its typical form also or instead.

Menninger describes the variety as the "most beautiful of the Vitex genus" and says that it shows great promise as an avenue tree in Florida. Cleghorn says that it is "a large tree, of great beauty when in flower". In his Introductory Offer of Flowering Tree Collection (1946) Menninger calls it V. altissima, but I have personally seen his stock and it is definitely var. alata. In his 1947 and 1953 Catalogue of Flowering Trees he assigns to it the correct varietal name, but in his 1955 Price List he reverts to the binomial and offers 2-foot seedlings at \$1.50 per foot.

Razi, in the reference cited above, records the variety from Mysore and calls it a microphanerophyte according to Raunkiaer's classification of life-forms. Herbarium material has been misidentified as V. altissima L.f., V. koordersii H. J. Lam, and V. pteropoda Miq.

The Bal collection cited below consists of very young shoots, probably taken from seedlings; some leaves are 1-foliolate, all the leaflets are serrate, and the petiole is more or less alate.



The Koorders & Koorders-Schumacher collections are juvenile forms, too, the leaflets being sharply or coarsely dentate-serrate. Dr. Lam annotated the Herb. Hort. Bot. Bogor. IV.A.64 specimen as "Vitex altissima forma foliis subtus glabratis, petiolis latius alatis". One of the Royen specimens cited below has a label reading "Erga dicitur"; the other is inscribed "Vitex (alata) foliis ternatis, quinatisque, petiolis alatis. Royen 777". Another label says "Sunhoc nose olim venit fructus qui Clutio Exot. pag. 26 quigitur, quique Rumphio vol. III, p. 2010 t. 119 repetitur. Linnaeo Eugenia dicitur Am. Ac. IV. p. 124, no. 114. Sed planta hoc non convenit. Vitex alata Royen 777."

In the Linnean Herbarium, under genus 811 [790], sheet number 3 is an unnamed specimen inscribed "Vitex ? Flores non observi" and "König 77" -- the ticket and note being in the handwriting of the younger Linnaeus, according to B. D. Jackson. The specimen is 3-foliolate, the leaves are glabrous beneath, and the petiole is widely winged from top to bottom. It is obviously V. altissima var. alata.

Willdenow's binomial, V. alata, is validly published in every sense of the Rules in the reference cited above. His plant is well described, and the name is based on a specimen sent to him by Roxburgh. The plant was regarded by Willdenow as quite distinct from his V. appendiculata, which had "foliis....subtus tomentosis.....Petiolis basi appendiculatis" and is apparently conspecific with typical V. altissima L.f. His V. alata, on the other hand, had "foliis....glabris.....Petiolus communis bipollinaris et ultra alatus."

The Netherlands specimens cited below do not bear on their labels any indication that they came from cultivated material, but it seems obvious that they must have.

Citations: INDIA: State undetermined: R. Wight s.n. [Peninsula Ind. Orientalis] (N). CEYLON: König 77, in part (Ls, N--photo, Z--photo). SUMATRA: Bal 30 (Bz--23301); Teijsmann 4237 H.B. (Bz--23302). JAVA: Backer s.n. [Sept. 1903] (Bz--24714); Koorders & Koorders-Schumacher 44434b [449\*] (Bz--23300), 44720b (Bz--23799). CULTIVATED: Florida: Menninger s.n. [Stuart, August 8, 1946] (N); H. N. Moldenke 21477 (Z). Netherlands: Herb. Lugd.-Bat. 908267-237 (Le); Royen 87 (E--photo, Le, N, N--photo, Z--photo), 777 (Le). India: Voigt s.n. [H. B. Seramp.] (Cp, N--photo, Z--photo). Java: Herb. Bur. Agric. Manila IV.A.64 (N); Herb. Hort. Bogor. XI.K.7 (Bz--25856, N), XI.K.7a (Bz, Bz, Bz, N), XII.B (VI).28 (Bz--25857, Bz--26246, Bz, Bz, N).

VITEX ALTISSIMA var. ZEYLANICA (Turcz.) C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 584. 1885.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (2): 223. 1863; Thwaites, Enum. Pl. Zeyl. 244. 1864; Hook. f., Fl. Brit. Ind. 4: 584. 1885; Journ. Agr. Univ. Porto Rico 20: 133 & 626. 1936; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 49 & 52. 1940; Moldenke, Alph.

List Invalid Names 52 & 56. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 56, 75, & 102 (1942) and [ed. 2], 130, 165, & 200. 1949.

Synonymy: Vitex zeylanica Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (2): 223. 1863. Vitex altissima f. subglabra Thwaites, Enum. Pl. Zeyl. 244. 1864.

This variety differs from the typical form of the species in having usually 5-foliolate leaves and in having the twigs, petioles, and leaflets glabrous throughout. The two lowermost leaflets are mostly greatly reduced in size and are often caducous.

The Puerto Rican material was reported (ex Leonard) in Journ. Agr. Univ. Porto Rico 20: 133 & 626 (1936) as V. altissima L.f., but all material from this island thus far seen by me proves to be var. zeylanica. The Brittons say that it grows there to be a tree 4 meters tall. It is attacked by the insect Saissetia oleae Bernard.

Citations: CEYLON: J. H. Fraser 178 (Du--166534). CULTIVATED: Puerto Rico: Britton & Britton 9872 (N), 9873 (N).

VITEX ALTMANNI Moldenke, Phytologia 4: 59. 1952.

Literature: Moldenke, Phytologia 4: 59, 80, & 83. 1952.

Tree or shrub; branches rather stout, gray, obtusely tetragonal, sometimes sulcate, minutely puberulous on the younger parts and at the nodes, glabrescent in age; twigs much more slender, puberulent; nodes annulate; principal internodes 1.5--13 cm. long; leaves decussate-opposite, 3-foliolate; petioles slender, 1.5--5 cm. long, compressed, nigrescent in drying, puberulous; leaflets 3, chartaceous, sessile or practically so, dark-green above, lighter beneath, brunnescent in drying, elliptic or obovate-elliptic, glabrous above, sparsely pilosulous beneath, more densely so along the midrib and larger venation, rounded or abruptly short-acuminate at the apex in cuspidate fashion, the central one 6.5--12.5 cm. long, 3.5--6.5 cm. wide, sometimes with a puberulent petiolule 1--2 mm. long, the lateral ones often very much smaller; midrib slender, flat above, prominulous beneath; secondaries slender, 7--10 per side, rather close and uniform, ascending, arcuate only toward the margins, flat above, prominulous beneath, anastomosing in loops near the margins; veinlet reticulation very abundant, mostly rather conspicuous and slightly subprominulous above (on mature leaves) and beneath; flowers and fruit not seen.

A common name for the plant is "boetboet".

Citations: JAVA: Altmann 577 (Bz--72938--type, N--photo of type, Z--photo of type). KANGÉAN ARCHIPELAGO: Kangean: Dames 55 (Bz--72942).

VITEX AMANIENSIS Pieper in Engl., Bot. Jahrb. Beibl. 141: 60, hyponym. 1928.

Literature: Pieper in Engl., Bot. Jahrb. Beibl. 141: 60. 1928; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 102 (1942) and [ed. 2], 117 & 200. 1949.

The species was based by Pieper on Warnecke 221 and Braun 1053, collected in the primeval forest at Amani, Tanganyika Territory. No formal description accompanies the name in any of the references cited above, but the name occurs in Pieper's key to species and a compilation of the key-characters yields a description as follows: younger parts hairy, with gray-brown hairs; leaflets broad, the length of the blade of the central one equal to its width or less than twice its width, entire, only sparsely hairy beneath; secondaries many, 15--25 in number, with the tertiaries parallel between them; inflorescence axillary, dichasially branched; flowers large, 8--13 mm. long; calyx weakly zygomorphic, hairy, its gray-brown hairs usually thin-walled, their many cells elliptic or ovate, its rim with distinct teeth; corolla hairy, with gray-brown hairs; ovary round, not elongate, glabrous but densely glandulose at the apex; fruit small to large (3.5 cm. in diameter).

VITEX AMBONIENSIS Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895.

Literature: Engl., Pflanzenw. Ost.-Afr. C: 340. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 329--330. 1900; Sim, For. Fl. & Res. Port. East-Afr. 94. 1909; Pieper in Engl., Bot. Jahrb. Beibl. 141: 68. 1928; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49--51, 75, & 102. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 116, 117, 120, 165, & 200. 1949.

Synonymy: Vitex laevigata J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 330. 1900 [not V. laevigata Herb. Madr., 1834]. Vitex amboinensis Gürke apud Worsdell, Ind. Lond. Suppl. 2: 500, sphalm. 1941.

A small or medium-sized tree, to 10 m. tall, of slender habit, or a bush, with white bark; branchlets and twigs slender or rather slender, gray or the youngest brownish-buff in drying, obtusely or rather acutely tetragonal, densely short-pubescent or very densely puberulent with yellowish, fulvous, or ochraceous hairs, becoming less so or even subglabrate in age, more densely fulvous-villous at the nodes and on young buds; nodes often annulate, more or less flattened-ampliate; principal internodes 1--4 cm. long, often abbreviated; leaf-scars rather large and corky-prominent on older branchlets; leaves decussate-opposite, normally 5- or 7-foliolate (sometimes 3-foliolate); petioles slender or stout, elongate, 3--11.2 cm. long, densely short-pubescent or puberulent with fulvous, yellowish, or ochraceous subfurfuraceous hairs, somewhat ampliate at the base, the older ones more or less flattened above and sulcate toward the base, convex beneath, not canaliculate nor margined; petiolules slender or very slender, 1--11 mm. long, densely short-pubescent or puberulent like the petioles, often canaliculate above, those of the 2 lowermost leaflets much reduced or subobsolete; leaflets unequal in size,

very variable in appearance, the blades chartaceous or subcoriaceous, varying to submembranous, green or dark-green above, nigrescent in drying, much lighter beneath, the central one elliptic, lanceolate-elliptic, or oblanceolate-elliptic, varying to oblong-lanceolate or oblong-cuneate, 3--18.5 cm. long, 1.5--6.6 cm. wide, acuminate or subacute at the apex, entire, acute or subacuminate at the base, very sparsely strigillose or glabrous above when mature, varying from finely pubescent to more or less densely puberulent or sparsely puberulent and gland-dotted beneath with brownish hairs, more densely so along the midrib and base of the secondaries, the lateral ones similar but smaller, the lowermost greatly reduced and often with obsolete petiolules; midrib slender, flat or subimpressed above, rounded-prominent beneath; secondaries slender or very slender, 7--19 per side, close together, ascending and arcuate only at the tips (otherwise quite straight) or arcuate-ascending, rather indistinctly arcuately joined at the margins, flat or subimpressed above, prominent beneath; vein and veinlet reticulation very abundant, obscure or indiscernible above, the rather sparse larger portions prominent or subprominent beneath, the finest portions very uniform, abundant, flat but conspicuous under a hand lens beneath; inflorescence axillary, small, cymose, shorter than the subtending petiolules; cymes solitary, few, 2--4 cm. long and wide, brachiate, rather few-flowered; peduncles slender, 1--1.5 cm. long; inflorescence-branches slender, they and the peduncles densely fulvous-puberulent or short-pubescent throughout like the petioles; pedicels obsolete or very slender, to 1 mm. long, densely short-pubescent; corolla mauve and white; fruiting-calyx patelliform, 1.5--2 cm. wide, its rim 5-lobed; fruit drupaceous, obovate or ellipsoid, to 2.5 cm. long and 1.7 cm. wide, hard, not fleshy, mucronate, glabrous, green and turning bronze, black or spotted with white.

Chandler reports the species as "growing between 2 large indigenous trees in the Bot. Gard.; small tree 25--30 feet tall, slender habit perhaps largely due to being under the 2 trees mentioned above....alt. 3900 feet". Gerstner notes that the appearance of the leaves is very variable. Codd describes the plant as a straggly shrub growing in the shade of dense bush on low rocky ridges or in low veld bush between sandstone koppies. He says it is 10 feet tall or else is a spreading-topped tree 12 feet tall with spreading branches; the fruit black, oval, and 1/2 inch wide, in June, growing at 1400 feet altitude. Meeuse calls it a small tree to 4 meters tall, with 3--5-foliolate leaves, or a dense short bush to 1 meter tall on wooded hillsides, flowering and fruiting in January, the fruit green, turning bronze. Van den Schyff describes it as a bush with thin stems, growing in the sand veld, flowering in December. It has been confused in herbaria with V. cymosa Bert. and V. patula E. A. Bruce.

The type of V. laevigata J. G. Baker is Kirk s.n. from Usaramo, Dar-es-Salaam. Other specimens cited by Pieper are Bittkau 2679, Braun 1880, Engler 3410, Holtz 2762, Stuhlmann 7626, and Zimmerman 925 & 2929, all from Tanganyika, Kirk 2 from Tete,

Portuguese East Africa, and Menyharth 762 from Northern Rhodesia.

Vitex laevigata is supposed to differ from V. amboniensis in having its leaflets not so strongly acuminate. Pieper, however, notes that this character is very inconstant and cannot be used to distinguish a second species. Miss Bruce's V. patula is very closely related to V. amboniensis and may, indeed, be conspecific with it. One of the specimens which she cites is the Codd 4227 cited below. Dr. Meeuse also feels that he can separate it by habit and the leaf-apex character.

Citations: UGANDA: Dawe 807 (K, N). TANGANYIKA TERRITORY: Busse 2613 (Be); Holst 2578 (K--isotype, N--photo of isotype, Z--photo of isotype). PORTUGUESE EAST AFRICA: Gazaland: Earthy 2 [Herb. Nat. Pretoria 7568] (Af, Af, N--photo, Z--photo). Lourenço Marques: Mrs. Monteiro 20 (K). UNION OF SOUTH AFRICA: Natal: Gerstner 4772 (Cb). Transvaal: Codd 4227 (Af, N, Rh), 5434 (N, Rh); Meeuse 9187 (Cb), 9195 (Z); Van der Schyff 3343 (Z). CULTIVATED: Uganda: Chandler 1196 (K, N--photo, Z--photo).

VITEX AMBONIENSIS var. AMANIENSIS Pieper in Engl., Bot. Jahrb. Beibl. 141: 69. 1928.

Literature: Engl., Bot. Jahrb. Beibl. 141: 69. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 102 (1942) and [ed. 2], 117 & 200. 1949.

This variety differs from the typical form of the species in part by its blunter and softer leaflets which are more densely hairy on the upper surface. It is based on Herb. Inst. Amani 221a from Tanganyika Territory.

VITEX AMBONIENSIS var. SCHLECHTERI Pieper in Engl., Bot. Jahrb. Beibl. 141: 69. 1928.

Literature: Engl., Bot. Jahrb. Beibl. 141: 69. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 102 (1942) and [ed. 2], 126 & 200. 1949.

This variety differs from the typical form of the species in its smaller leaflets, which in immature specimens are only to 5 cm. long, but probably are longer on mature specimens, and are densely hairy on both surfaces. Contrary to the condition seen in var. amaniensis, in the present variety the hairs are more sparse along the midrib on the upper surface.

Pieper states that this variety may possibly be conspecific with V. tangensis Gürke, but thus far herbarium material of it is too sparse to be sure whether the count of leaflets per leaf is actually characteristic of it. The variety is based on Schlechter 11715 from Lourenço Marques, Portuguese East Africa.

VITEX ANDONGENSIS J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 329--330. 1900.

Literature: Thiselt.-Dyer, Fl. Trop. Afr. 5: 329--330. 1900; Hiern, Cat. Afr. Pl. Welw. 4: 837. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 193. 1904; Pieper in Engl., Bot. Jahrb. Beibl. 141: 60. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed.

1], 51 & 102 (1942) and [ed. 2], 119 & 200. 1949.

A tree; branchlets clothed with short drab pubescence; leaves 5-foliolate; petiole 7.5--10 cm. long; leaflets subcoriaceous, green and glabrous above when mature, oblong, all distinctly stalked, drab-pubescent beneath, the central one about 10 cm. long and 5 cm. wide; cymes axillary, short-pedunculate, their branches very pubescent; calyx campanulate, about 1 mm. long, densely clothed with pale drab pubescence, its teeth obscure; corolla small, very hairy outside; fruit not known.

The species is based on Welwitsch 5696 from Pungo Andongo, Loanda, Angola.

VITEX ANGOLENSIS Gürke in Engl., Bot. Jahrb. 18: 167. 1894.

Literature: Engl., Bot. Jahrb. 18: 167. 1894; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 325. 1900; Hiern, Cat. Afr. Pl. Welw. 4: 835. 1900; Pieper in Engl., Bot. Jahrb. Beibl. 141: 70. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 102 (1942) and [ed. 2], 119 & 200. 1949.

A tree; branchlets densely pubescent; leaves 5-foliolate; petioles 4--5 cm. long; leaflets moderately firm, green and obscurely pubescent above when mature, paler and pubescent all over beneath, oblong-cuneate, obtuse at the apex, entire, nearly sessile, the central one about 4 cm. long and 1.3 cm. wide; cymes axillary, short-pedunculate, few-flowered; calyx campanulate, about 3 mm. long, densely pubescent, its rim distinctly toothed; corolla-tube twice as long as the calyx, its lobes short; fruit the size of a large pea.

The species was based by Gürke on Welwitsch 5758, although Hiern in the reference cited above says "5757", apparently in error, from the province of Huila, Angola. Pieper also cites Baum 298 from between Kubango and Quebe, and Newton s.n. from Gambos, Huila. It has been collected at altitudes of from 3800 to 5500 feet.

VITEX APPUNI Moldenke, Geogr. Distrib. Avicenn, 21 & 26, nom. nud. (1939), Phytologia 1: 484--485. 1941.

Literature: Moldenke, Geogr. Distrib. Avicenn. 21 & 26. 1939; Moldenke, Phytologia 1: 484--485. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 39, & 102 (1942) and [ed. 2], 67, 94, & 200. 1949.

Shrub or tree; branchlets and twigs medium or slender, obtusely tetragonal or subterete, medullose, gray-brown, the youngest shoots densely short-pubescent with cinereous pubescence, the older ones sparsely puberulent or subglabrate; leaf-scars on older wood rather large and semicircular, usually with elevated margins; nodes not annulate; principal internodes 1.5--6 cm. long or more abbreviated on short axillary twigs; leaves decussate-opposite, 3- or 5-foliolate, mostly 3-foliolate; petioles very slender, 1.2--6 cm. long, convex beneath, flattened above, densely short-pubescent like the young twigs; leaflets when 3 subequal in size or the lateral ones slightly smaller, when 5 the two lowermost often much reduced, all sessile or the central

one only subsessile; leaflet-blades submembranous, rather dark-green above, much lighter beneath, the central one elliptic or subobovate-elliptic, 3--9 cm. long, 1.5--3 cm. wide, acuminate at the apex and base (the lateral ones usually acute at the base), entire or coarsely and irregularly serrate with rather few blunt teeth, densely puberulent above, becoming much more sparsely so in age, very densely short-pubescent or tomentellous beneath; midrib very slender, subimpressed above, prominulent beneath; secondaries very slender, 9--11 per side, flat (and often inconspicuous) or subimpressed above, prominulent beneath, arcuate-ascending, not plainly anastomosing; vein and veinlet reticulation mostly obscure on both surfaces; inflorescence axillary, cymose, capitate, 3--7 cm. long, 1--2.5 cm. wide, densely many-flowered; peduncles slender, 2--5.5 cm. long, more sparsely short-pubescent than the young twigs, flattened; pedicels very slender, 1--3 mm. long; bracts none; bractlets few, linear, 2--4 mm. long, densely pubescent; prophylla minute, setaceous, 1 mm. long or less, densely pubescent; calyx campanulate, light, about 2 mm. long and 1.5 mm. wide, densely short-pubescent with appressed antrorse hairs, its rim shortly 5-toothed; corolla hypocrateriform, its tube broadly cylindrical, about 6 mm. long, ampliate at the apex, glabrous at the base, puberulent outside above the calyx, its limb 2-lipped, the small lobes oblong, about 3 mm. long, the central lower one much enlarged, about 6 mm. long, pubescent at the base within, all more or less densely short-pubescent outside; stamens and style somewhat exerted; fruiting-calyx and fruit not known.

It has been collected on dry savannas.

Citations: BRITISH GUIANA: Appun 1885 (K--type, N--isotype). BRAZIL: Amazonas: G. H. H. Tate 52 (N).

VITEX AUREA Moldenke, *Phytologia* 3: 428--429. 1951.

Literature: Moldenke, *Phytologia* 3: 423--429 & 459. 1951.

Small tree, to 8 m. tall; branches and branchlets medium-slender, grayish, very obtusely tetragonal or subterete, more or less ferruginous-tomentellous, glabrescent in age; twigs very densely tomentellous-pubescent with yellowish or ferruginous hairs; nodes often obscurely annulate; principal internodes 0.5--5 cm. long, mostly much abbreviated on the twigs; leaves decussate-opposite, 1-foliolate; petioles stoutish, 0.5--2 cm. long, flattened and sulcate above, densely tomentellous with yellowish or ferruginous hairs; blades firmly chartaceous or subcoriaceous, much lighter beneath, elliptic or obovate, 4--9 cm. long, 1.5--6.5 cm. wide, varying from rounded to obtuse or abruptly acute at the apex, entire, varying from rounded to acute at the base, more or less tomentellous-pubescent on both surfaces, becoming glabrescent above, the hairs flavidous or ferruginous; midrib slender, flat or subimpressed above, prominent beneath; secondaries slender, 3--10 per side, ascending, slightly arcuate toward the margins, flat above, prominent beneath; veinlet reticulation abundant, obscure or indiscernible above, very prominent beneath; inflorescence axillary, cymose, mostly shorter than the subtend-

ing leaves, rather many-flowered; peduncles rather slender, 1--3 cm. long, flattened, densely flavidous-tomentellous; cyme-branches mostly abbreviated, densely flavidous-tomentellous; pedicels mostly obsolete; bractlets numerous, linear, 2--5 mm. long, densely yellow-tomentellous, conspicuous, firm; calyx campanulate, 3--4 mm. long and wide, very densely golden-tomentellous on the outside, its rim truncate and subentire; corolla-tube cylindric, 1.2--1.5 cm. long, slightly curvate, very densely golden-villous on the outside, the lobes about 2 mm. long, erect; stamens and pistil exerted about 5 mm. from the corolla-tube.

The species is endemic to Madagascar and is found in forests at about 2000 meters altitude.

Citations: MADAGASCAR: Perrier de la Bâthie 16316 (N, P), 16317 (N--photo of type, P--type, Z--photo of type).

VITEX AXILLARIS Wall., Numer. List [48], no. 1760, hyponym. 1829.

The name, originally proposed as "V.? axillaris", is based on Wallich's 1760 from Tavoy in Upper Burma.

VITEX BALBI Chiov., Racc. Bot. Miss. Consol. Kenya 99. 1935.

Nothing is known by me about this species except that it is said to inhabit Kenya.

VITEX BARBATA Planch. ex J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 323. 1900.

Literature: Thiselt.-Dyer, Fl. Trop. Afr. 5: 323. 1900; Bull. Mus. Nat. Hist. 385. 1919; Pieper in Engl., Bot. Jahrb. Beibl. 141: 61. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 45--48 & 102. 1942; Moldenke, Phytologia 2: 118. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 111, 112, 114, & 200. 1949.

A tree; young branchlets densely clothed with fine spreading hairs; leaves 3-foliolate; petioles 6.5--7.5 cm. long; leaflets subcoriaceous, green and glabrous above when mature, obovate-cuneate, entire, short-petiolulate, obtuse at the apex, slightly pubescent on the midrib beneath, the central one 7.5--10 cm. long, 3.8--5 cm. wide; cymes copious, axillary, long-pedunculate, dense, their branchlets villous; pedicels very short; calyx campanulate, about 3 mm. long, densely villous, the teeth very short; corolla 2 or 3 times the length of the calyx; fruit the size of a cherry.

The species was based on Heudelot 30 from Senegal, Heudelot s.n. from Senegambia, and Scott-Elliott 4881 from Sierra Leone. It is said to grow in bush country in hilly regions. Pieper cites also Lecard 161 from Senegal. Common names are "ba-kudu-ne" "kuru", and "kutu-fingo".

Citations: FRENCH EQUATORIAL AFRICA: Gabun: Krukoff 119a (N).

VITEX BEFOTAKENSIS Moldenke, Phytologia 3: 429--430. 1951.

Shrub; branchlets slender, gray, obtusely tetragonal, glabrous; twigs very slender, light-gray, the youngest parts canescent-puberulous, the older parts glabrescent; nodes not annulate;



principal internodes 0.5--3 cm. long; leaves decussate-opposite, 1-foliolate; petioles slender, 6--9 mm. long, flattened above, minutely canescent-puberulous or glabrescent; blades rather firmly chartaceous, rather uniformly bright-green on both surfaces, somewhat nigrescent in drying, elliptic or ovate-elliptic, 3.5--8.5 cm. long, 3--4 cm. wide, varying from rounded or obtuse on smaller leaves to acute or very shortly acuminate on larger ones, entire, varying from rounded to acute or short-acuminate at the base, glabrous and shiny on both surfaces; midrib slender, flat above, prominent beneath; secondaries filiform, 4--6 per side, ascending, mostly flat above, very slightly prominulous beneath, anastomosing in shallow loops several mm. from the margins beneath; veinlet reticulation rather sparse, obscure or indiscernible above, obscure beneath; inflorescence axillary, cymose, much shorter than the subtending leaves; cymes 1--3-flowered; peduncles filiform, 3--10 mm. long, rather densely whitish-strigillose with closely appressed antrorse hairs; bractlets lanceolate-ovate, 2--3 mm. long, about 1 mm. wide, densely cinereous-strigose, 1--3 pairs per cyme; pedicels filiform, 3--9 mm. long, densely cinereous-strigillose; calyx campanulate, about 5 mm. long and 4 mm. wide, 5-toothed, the tube densely cinereous-strigillose, the teeth 1--1.5 mm. long, less densely strigillose and mostly conspicuously nigrescent in drying, acute or subacute at the apex, minutely strigillose within; corolla clear-pink, curvate-cylindric, densely brownish-villosulous on the outside, the tube 10--13 mm. long, the lobes about 2 mm. long; fruiting-calyx thin-textured, nigrescent in drying, cupuliform, to about 7 mm. long and wide, sparsely and minutely strigillose, its rim plainly 5-toothed.

The species is endemic to Madagascar and is known only from the type collection, flowering in September.

Citations: MADAGASCAR: Decary 4757 (N--isotype, N--photo of type, P--type, Z--photo of type).

VITEX BENTHAMIANA Domin, *Bibl. Bot.* 89 (6): 1114 & 1117, fig. 182. 1928.

Literature: Benth., *Fl. Austral.* 5: 67. 1870; F. M. Bailey, *Syn. Queensl. Fl.* 379. 1883; F. M. Bailey, *Cat. Pl. Queensl.* 35. 1890; F. M. Bailey, *Queensl. Fl.* 4: 1179. 1901; F. M. Bailey, *Compreh. Cat.* 386. 1913; Domin, *Bibl. Bot.* 89 (6): 1114 & 1117, fig. 182. 1928; Moldenke, *Alph. List Invalid Names* 55. 1942; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 70 & 102 (1942) and [ed. 2], 154 & 200. 1949.

Synonymy: Vitex trifolia var. parviflora Benth., *Fl. Austral.* 5:67. 1870.

Illustration: Domin, *Bibl. Bot.* 89 (6): 1117, fig. 182. 1928.

Shrubby; branches slender; leaves small, 3--5-foliolate; leaflets small, lanceolate or ovate-lanceolate, acute or acuminate at the apex, clothed beneath with compact, slender, white tomentum, sessile or the central one attenuate to a very short petiolule; flowers much smaller than in V. trifolia L.

This plant is known only from the Northern Territory and the

northern part of Queensland, according to Domin, who cites one of his own collections from the barren hills by Cloncurry, Queensland, and a collection of Landsborough from the Gulf of Carpenteria, Northern Territory. Domin states that it is a low erect shrub about 1.5 m. tall and of very characteristic habit, usually forming a dense colony. He says also that the material from Moreton Bay regarded as the same taxon by Bentham does not belong here.

I am of the opinion that this species will prove to be nothing more nor less than V. trifolia var. bicolor (Willd.) Moldenke. If so, then Bentham's trinomial will have priority over mine.

VITEX BENUENSIS Engl., Pflanzenw. Afr. 5 (1): 46 & 50, nom. nud. (1925); Pieper in Engl., Bot. Jahrb. Beibl. 141: 49. 1928.

Literature: Engl., Pflanzenw. Afr. 5 (1) [Engler & Drude, Veg. Erde 9]: 46 & 50. 1925; Pieper in Engl., Bot. Jahrb. Beibl. 141: 49 & 66. 1928; Hill, Ind. Kew. Suppl. 8: 249. 1933; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Known Geogr. Distrib. Verbenac. [ed. 1], 48 & 102 (1942) and [ed. 2], 114 & 200. 1949.

Pieper cites Ledermann 4400, 4743, 4764a, and 4778, all from Cameroons. As far as I know, no full description of this species has ever yet been published, but it occurs in Pieper's key and the lines in that key constitute a validating description of sorts. Such a compiled description would indicate that the species has fleshy leaflets, often more than 10 cm. wide, sparsely hairy on both surfaces; inflorescence axillary, dichasially branched, few- (to 10-) flowered; bractlets narrow, thread-like or sometimes lanceolately widened at the apex; flowers small, to 11 mm. long; calyx-teeth distinct, regular, large, to half the total length of the calyx; corolla-lobes erect; ovary more or less rounded, covered with many erect hairs and often also with glands which are, however, obscured by the dense pubescence.

VITEX BEQUAERTI DeWild. in Fedde, Repert. 13: 142. 1914.

Literature: Fedde, Repert. 13: 142. 1914; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 102 (1942) and [ed. 2], 115 & 200. 1949.

Pieper cites Bequaert 314 and Homblé 202 from Ober-Katanga, Elizabethville, Belgian Congo.

VITEX BERAVIENSIS Vatke, Linnaea 43: 535. 1882.

Literature: Vatke, Linnaea 43: 535. 1882; Danguy, Bull. Hist. Nat. Paris 30: 509. 1924; Pieper in Engl., Bot. Jahrb. Beibl. 141: 78. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 102 (1942) and [ed. 2], 123 & 200. 1949.

Tree, to 7 m. tall; branchlets medium-slender, obtusely tetragonal or subterete, gray, glabrous, the youngest ones nigrescent in drying; nodes not annulate; principal internodes 1--5 cm. long; leaf-scars rounded-umbonate, surrounded by a thin elevated margin; leaves mostly 5-foliolate, rarely 3-foliolate, decussate-opposite; petioles slender, 5--9.5 cm. long, glabrous, flattened or canaliculate above, brunnescent in drying; petiolules slender,

0.8--3.5 cm. long, glabrous, brunnescent; leaflets chartaceous, elliptic or elliptic-lanceolate, rather uniformly green on both surfaces, often brunnescent in drying, the two lowest mostly much smaller than the other three, the central one 5.5--10.5 cm. long, 3--5 cm. wide, varying from acute or obtuse to rounded or emarginate at the apex, entire, abruptly acute or rounded at the base, sometimes asymmetric, glabrous and shiny on both surfaces or with a few hairs along the midrib and in the axils of the secondaries beneath; midrib slender, flat above, prominent beneath; secondaries very slender, 10--12 per side, divergent-ascending, rather close, straight and parallel, arcuately joined at the margins beneath, plane above, prominulous beneath; veinlet reticulation mostly obscure on both surfaces; inflorescence axillary or slightly supra-axillary, cymose, loosely many-flowered; peduncles slender, 2.5--12 cm. long, glabrous, mostly brunnescent in drying; cymes about 5 times dichotomous, the branches widely divaricate, slender, flattened, glabrous or nearly so, a pair of long-stalked, leaflet-like, spatulate bracts often subtending the lowermost furcation and 1--2.5 cm. long (including the stalk), glabrous on both surfaces; bractlets subtending the upper furcations linear, oblong, or setaceous, 1--4 mm. long, nigrescent, glabrous or nearly so; pedicels slender, flattened, nigrescent, 1--2 mm. long; calyx campanulate or cupuliform, about 2 mm. long and wide, glabrous on the inner surface, glabrous or nearly so on the outside, nigrescent in drying, its rim truncate and entire or subentire with very minute apiculations; corolla bilabiate, 8--12 mm. long, lilac with a yellow throat, its tube about 7 mm. long, densely ochraceous-velutinous above the calyx on the outside, the limb about as long as the tube, the anterior lip 3-lobed, the median lobe larger than the others, the posterior lip 2-lobed, all the lobes about 6 mm. long, densely puberulent on the inner surface, densely barbate-tomentose at the base; stamens 4, didynamous, inserted at about the middle of the corolla-tube, exserted; filaments slightly swollen and hairy at the base; ovary ovoid, about 1 mm. long, glabrous; style filiform, 10--13 mm. long, glabrous; stigmas 2, incurved, short, acute; fruiting-calyx shallowly cupuliform or subpatelliform, incrassate, nigrescent, indurated, to 7 mm. wide, deeply but irregularly lobed, scarious-margined, glabrous, sometimes entire and completely patelliform and to 15 mm. wide; fruit drupaceous, hard and nigrescent in drying, subglobose, usually 5--7 mm. long and wide, very shiny.

The species is endemic to Madagascar, where it is called "voha-méha" or "voaméa" and its wood is used for construction purposes. The type is Hildebrandt 3085a, according to the original description, and apparently was deposited in the herbarium at the Botanisches Museum in Berlin. Since this is now destroyed, I think we may well regard Hildebrandt 3085 as a cotype (or, perhaps more accurately, lectotype) collection, and I am so citing it.

Pieper places the species in his group Haplotriches and says it is most closely related to V. schlechteri Gürke. The latter is now regarded as conspecific with V. harveyana H. H. W. Pearson and as a synonym of it. Pieper cites a Grevé 69 and a Baron

4771. The latter collection, however, is f. villosa Moldenke. Danguy cites a Pervillé 187 from Ambongo. He also cites Grandidier s.n., Duliot s.n., and Grevé 57 and 65, all of which I regard as f. pilosa Moldenke, and Grevé 35 and Louvel 154 which are f. villosa. It has been collected in flower in February, March, July, and September and in fruit in June. It has been confused in herbaria with Maerua arenaria Hook. f. & Thoms. of the Capparidaceae.

Citations: MADAGASCAR: Baron 6834 (K); Decary 8023 (N, P); Hildebrandt 3085 (K--cotype, N--cotype, N--photo of cotype, P--cotype, P--cotype, Z--photo of cotype); Perrier de la Bâthie 1632 (P), 1632bis (P, P); Pervillé 587 (K, P); Service Forestier 22 (P); Ursch 199 (N, P).

VITEX BERAIVIENSIS var. ACUMINATA Moldenke, Phytologia 3: 430. 1951.

This variety differs from the typical form of the species in having its branchlets plainly tetragonal and minutely puberulous, leaves 5- or 6-foliolate, petioles slightly longer and minutely puberulous, petiolules to 4 cm. long, leaflet-blades to 14.5 cm. long and long-acuminate at the apex, and the fruit about 2 cm. long and 1.5 cm. wide, black when mature. The tree becomes 20 m. tall, with a trunk 1 m. or more in diameter.

The variety is endemic to Madagascar and inhabits sandy woods, limestone hills and plateaus, tropophilous forests, and seaside woodlands, from sea level to altitudes of 270 meters. It has been collected in anthesis in January, April, June, August, and December, and in fruit in August. Common names are "hazomay" and "voansekongo".

Synonymy: Vitex arborea Bréon, in herb. [not V. arborea Desf., 1847, nor Fischer, 1829, nor Roxb., 1814]. Vitex heptaphylla Rich., in herb. [not V. heptaphylla A. L. Juss., 1806].

Citations: MADAGASCAR: Bernier s.n. [côte oriental, 1846] (N, P); Boivin 1796 (P); Bréon s.n. (P); Humbert 19006 (P); Perrier de la Bâthie 1524 (P), 1595 (P, P), 1595bis (N--photo of type, P--type, Z--photo of type), 10203 (P), 10205 (P), 10260 (P); Richard 247 (P), 299 (P), 513 (P), s.n. [Daie d'Antongie] (P), s.n. (P); Service Forestiere 8 (P), 47 (N, P).

VITEX BERAIVIENSIS f. PILOSA Moldenke, Phytologia 3: 430. 1951.

This form differs from the typical form of the species in having the calyx more or less appressed-pilose during and before anthesis and often even after anthesis, and in having the petioles, petiolules, inflorescence-branches, lower leaflet-surfaces, and young twigs also more or less pilose-puberulent. The immature fruit is clear-green; the tree becomes at least 5 m. tall.

The form is endemic to Madagascar and grows in forests on limestone rock at altitudes of 200 to 280 meters. It has been collected in anthesis in March and October.

Citations: MADAGASCAR: Baron 4582 (K), s.n. (P); Douliot s.n.

[Morondava, October 19, 1897] (P); Grandidier s.n. [Morondava, 1879] (P); Grevé 57 (P), 65 (K--type, N--isotype, N--photo of type, P--isotype, P--isotype, Z--photo of type); Humbert 14421 (P); Leandri 694 (N, P), 1014 (N, P).

VITEX BERAIVIENSIS f. VILLOSA Moldenke, Phytologia 3: 431. 1951.

This form differs from the typical form of the species in having the calyx and bractlets densely villous with sordid-canescens hairs, and in having the petioles, petiolules, peduncles, inflorescence-branches, and young twigs usually rather densely puberulent or short-pubescent and the lower leaflet-surfaces more or less puberulent-pilose.

The form is endemic to Madagascar, where it is known as "voamea". It is said to be a small tree, 10--12 m. tall, growing in savannas at altitudes of 50 to 300 meters, collected in anthesis in February, October, and December.

Citations: MADAGASCAR: Baron 4771 (K, P), 6790 (K); Grevé 35 (P); Humbert 14460 (P), 19711 (N--isotype, N--photo of type, P--type, Z--photo of type); Louvel 154 (P).

VITEX BETSILIENSIS Humbert, Not. Syst. 8: 22. 1939.

Shrub or tree, 3--10 m. tall; branches and branchlets rather stout, obtusely tetragonal, densely white-tomentose, less so in age; nodes inconspicuously annulate; principal internodes 1.5--6 cm. long, mostly abbreviated; leaves decussate-opposite, 1-foliolate; petioles very stout, 1--2.5 cm. long, apparently articulate at the apex, densely appressed-tomentose, the indumentum at first white, later sordid-gray; blades very thick-coriaceous and stiff, very bright green and shiny above, elliptic, rarely slightly obovate, 4--9.5 cm. long, 1.5--4.1 cm. wide, mostly obtuse or rounded (sometimes emarginate, rarely acute or mucronate) at the apex, entire and revolute along the margins, rounded at the base, glabrous above when mature, loosely white-tomentellous above when immature, very densely white-tomentose beneath, the indumentum turning sordid-grayish in age; midrib very stout, deeply impressed above, very stout and prominent beneath; secondaries more slender, numerous, close together, rather straight, divaricate-ascending, 13--15 per side, rather inconspicuous above, prominulous beneath; veinlet reticulation very abundant, conspicuously impressed to the finest details above, prominent beneath but often obscured by the indumentum; inflorescence axillary, abbreviated, few-flowered, much shorter than the subtending leaves, very densely white-tomentose with closely matted indumentum throughout, becoming sordid-grayish in age; peduncles about 0.5--1.5 cm. long, often obscured; inflorescence-branches usually only 2, less than 1 cm. long; bractlets linear, 7--12 mm. long, densely matted-tomentose like the peduncles and cyme-branches; calyx in anthesis campanulate, 3--12 mm. long, 7--3 mm. wide, very densely matted-tomentose or lanate with white indumentum, its rim plainly 5-dentate, the teeth 1.5--2 mm. long, oblong-lanceolate or ovate, erect, stiff; corolla rosy-white or pale-violet, its tube about 15 mm. long, densely white-tomentose

outside above the calyx; anthers brown; fruiting-calyx unchanged, the teeth involute (obvolute) over the (immature?) fruit.

The species is endemic to Madagascar and has been found in forests on granite, quartzite, siliceous, and other types of rock, at altitudes of from 1200 to 1800 meters, in anthesis in February, March, May, June, August, and December.

Citations: MADAGASCAR: Decary 13057 (P--cotype), 14020 (N, P); Humbert 7116 (P--cotype), 14519 (N--photo of cotype, P--cotype, Z--photo of cotype); Perrier de la Bâthie 10185 (N--cotype, P--cotype), 13126 (P--cotype, P--cotype), 18480 (P--cotype). CULTIVATED: Madagascar: Herb. Jard. Bot. Tananarive 27-2 [145] (P).

VITEX BETSILIENSIS ssp. BARORUM Humbert, Not. Syst. 8: 23--24. 1939.

This subspecies differs from the typical form of the species in having smaller leaves which are only thin-coriaceous, 1.5--6 cm. long, 0.5--3 cm. wide, distinctly acute at the apex, the indument on the lower surface much shorter and appressed, and the calyx in anthesis smaller, about 5 mm. long and 3 mm. wide, conspicuously costate, with short closely appressed tomentum.

It is said to be a shrub or small tree, 4--3 m. tall, with violet corollas, growing in sclerophyllous forests on siliceous rock, from 800 to 1200 meters altitude, endemic to Madagascar. It has been collected in anthesis in June, July, November, and December. A common name is "haronganala". Humbert describes the leaves as chartaceous, but I would term them thin-coriaceous.

Citations: MADAGASCAR: Humbert 11632 (P), 12648 (P), 12649 (P--cotype); Humbert & Swingle 4908 (N--cotype, P--cotype); Perrier de la Bâthie 19267 (N--photo of cotype, P--cotype, Z--photo of cotype).

VITEX BOGALENSIS Wernham, Cat. Pl. Talbot Oban Dist. 91. 1913.

Literature: Wernham, Cat. Pl. Talbot Oban Dist. 91. 1913; Pieper in Engl., Bot. Jahrb. Beibl. 141: 74. 1923; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 102 (1942) and [ed. 2], 114 & 200. 1949.

The species is based on Talbot 1046 from Bogalo Peak, northern Cameroons. According to Pieper it belongs either in the group Simplices or Elongatae.

VITEX BOJERI Schau. in A. DC., Prodr. 11: 694. 1847.

Literature: A. DC., Prodr. 11: 694. 1847; Pieper in Engl., Bot. Jahrb. Beibl. 141: 78. 1923; Moldenke, Alph. List Invalid Names 13 & 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 102 (1942) and [ed. 2], 123 & 200. 1949.

Synonymy: Chrysomallum integrifolium Bojer ex Schau. in A. DC., Prodr. 11: 694, in syn. 1347. Vitex ferruginea Bojer ex Schau., loc. cit., in syn. 1847 [not V. ferruginea Vahl, 1313, nor Schum. & Thonn., 1327, nor Baker, 1900]. Vitex ferruginea H. & B., in herb. Vitex ferrugineum Bojer, in herb.

Liana-like shrub or tree, 7--13 m. tall; branches, branchlets,

and twigs rather slender, conspicuously obtusely tetragonal, often lichen-encrusted, densely puberulent or sometimes brown-tomentose on the younger parts, glabrescent in age; nodes not annulate; principal internodes greatly abbreviated, 0.4--4 cm. long; leaf-scars large and prominent, corky, especially on the twigs; leaves decussate-opposite, numerous on many short twigs, 1-foliolate; petioles rather stoutish, 3--9 mm. long, densely puberulent with fulvous hairs or sometimes densely brown-tomentose; blades thin-coriaceous, dark-green above, somewhat lighter beneath, elliptic or elliptic-ovate, 1.4--9 cm. long, 0.5--5.9 cm. wide, subacute or obtuse at the apex or sometimes rounded or emarginate, entire and often subrevolute along the margins, acute or obtuse at the base, often loosely pilose-pubescent above when young, but glabrous or subglabrous above when mature, densely puberulent or short-pubescent and resinous-punctate beneath when mature, often tomentellous beneath when young; midrib slender, impressed above, prominent beneath; secondaries slender, 5--7 per side, arcuate-ascending, subimpressed above, prominent beneath, prominently anastomosing in loops near the margins beneath; veinlet reticulation abundant, obscure or slightly subimpressed above, prominent beneath; inflorescence axillary, few-flowered, sessile or subsessile; bractlets broad, ovate-lanceolate or ovate, leathery, 3--4 mm. long, about twice as long as wide, short-acuminate at the apex, very densely short-pubescent on both surfaces with brown hairs, the venation not plainly visible; peduncles mostly greatly abbreviated, to 4 mm. long, densely short-pubescent or sometimes densely brown-tomentose; pedicels 1--2 mm. long, densely brown-pubescent or -tomentose; calyx campanulate, about 4 mm. long and wide, densely brown-pubescent, its rim distinctly 4- or 5-toothed, the teeth ovate-triangular, small, about 1 mm. long, attenuate-acute; corolla red, normal in development, its tube cylindrical, curvate, about 2.5 cm. long, about 2 mm. wide at the base and 6 mm. wide at the apex, densely long-pubescent with brown hairs and resinous-punctate on the outside, its rim 5-lobed, the lobes ovate, about 3 mm. long, acute; fruiting-calyx somewhat enlarged and incrassate, broadly campanulate, about 5 mm. long and 7 mm. wide, densely brown-pubescent, its teeth prominent, 2 mm. long, erect; fruit drupaceous, about 8 mm. long and 5 mm. wide, glabrous and shiny.

The species is endemic to Madagascar and is said to inhabit open woods and dry forests, at altitudes of 1600 to 1800 meters. It has been collected in anthesis in April, August, and November, and is called "kivazo".

Citations: MADAGASCAR: Baron 1276 (K, P), 2972 (K, P), 5304 (K, P); Bojer s.n. [Be-zon-zong] (K--isotype, N--isotype, N--photo of isotype, P--isotype, P--isotype, Z--photo of isotype), s.n. [Mad.] (K), s.n. [An-ranoa Madiou, Emirne] (K); Bouton s.n. [interior of Madagascar, 1867] (K); d'Alleizette 1285m (P); Decary 4831 (H, P); Herb. Jard. Bot. Tananarive 4663 (P); Hildebrandt 3672 (K, N, P); C. W. Parker s.n. [Andrangaloaka, 1831] (K).

VITEX BOJERI var. SUBORBICULARIS Moldenke, *Phytologia* 3: 431. 1951.

This variety differs from the typical form of the species in having its leaf-blades coriaceous, 1.5--3 cm. long and wide, truncate or emarginate at the apex (rarely mucronulate-acute), very lightly and obscurely puberulent beneath, eventually more or less glabrescent except for the larger venation, densely resinous-punctate beneath, and its calyx puberulent, lobed to the middle, the lobes 2 mm. long.

It is said by Humbert to be a shrub or small tree with very coriaceous leaves which are thick and stiff, shiny above, dull and pale beneath, the veins of first, second, and third rank impressed above and prominent beneath, the tertiaries reticulate and less prominent beneath. The calyx is violet, the corolla red-carmine or dark-red on the outside, sometimes yellowish-green on the outer surface of the lobes, tinted orange on their inner surface, the stamens carmine, the anthers olive-green, and the style yellow-green or else red at the base and pale-green at the apex. It grows in licheniferous woods on gneiss and quartzite rock, at altitudes of 2000 to 2100 meters. It has been collected in anthesis in March and December, and is endemic to Madagascar.

Citations: MADAGASCAR: Humbert 22624 (N--isotype, N--photo of type, P--type, Z-- photo of type); Humbert & Cours 23805 (P).

VITEX BRACTEATA S. Elliot, *Journ. Linn. Soc. Lond.* 29: 42. 1891.

Literature: *Miq., Fl. Ind. Bat.* 2: 862. 1856; Scott Elliot, *Journ. Linn. Soc. Lond.* 29: 42. 1891; Pieper in *Engl., Bot. Jahrb. Beibl.* 141: 78. 1928; Moldenke, *Prelim. Alph. List Invalid Names* 50. 1940; Moldenke, *Alph. List Invalid Names* 52. 1942; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 53 & 102 (1942) and [ed. 2], 123 & 200. 1949.

Shrub or small tree; branchlets medium-slender, grayish, minutely puberulent, glabrescent in age, obtusely tetragonal; twigs slender, densely short-pubescent or puberulent with red-brown hairs; nodes not annulate; principal internodes 0.4--4 cm. long, mostly abbreviated; leaves decussate-opposite, 1-foliolate; petioles slender, 0.7--2 cm. long, densely pubescent or puberulent with brown hairs, canaliculate above; blades firmly chartaceous or subcoriaceous, rather uniformly dark-green on both surfaces, often brunnescent in drying, ovate or oblong-elliptic, 1.7--7 cm. long, 1.3--4.5 cm. wide, mostly rounded or retuse at the apex, varying to subacute or obtuse, entire, rounded or subtruncate at the base, glabrous and shiny above, densely puberulent and resinous-punctate beneath; midrib slender, mostly plane above, sharply prominent beneath; secondaries very slender, 6--8 per side, divergent-ascending, short, arcuately joined in many loops 1.5 mm. from the margins beneath; veinlet reticulation abundant, mostly conspicuous and sharply prominulous above, prominulous beneath; inflorescence axillary, cymose, few-flowered, mostly only once dichotomous, conspicuously bracteate; peduncles slender, 3--4.5 cm. long, flattened, puberulent, somewhat club-shaped



at the apex; cyme-branches slender, flattened, about 1 cm. long, puberulent; pedicels filiform, flattened, 2--10 mm. long, puberulent; bracts membranous, foliaceous, ovate-elliptic, 7--10 mm. long, 4--8 mm. wide, acute at both ends, more or less puberulous and resinous-granular, glabrescent in age, sessile; calyx herbaceous, developing much more rapidly than the corolla (*i.e.*, the young corolla-bud lying at the base of a many times larger calyx), about 1 cm. long and 7 mm. wide, lightly pulverulent-puberulent, nigrescent in drying, its rim 6-lobed, the lobes ovate-triangular, erect, about 2 mm. long, acute at the apex; corolla red; ovary merely glandulose.

The species is endemic to Madagascar and is placed by Pieper in his subgenus Chrysomallum, section Simplicifoliae. The specific name adopted for the species is not invalidated by the Vitex bracteata Horsf. ex Miq., Fl. Ind. Bat. 2: 862 (1856) because the latter was published only in synonymy and never has been validated. It falls into the synonymy of V. pinnata L.

Citations: MADAGASCAR: Scott Elliot 2467 (K-type, N--isotype, N--photo of type, P--isotype, Z--photo of type).

VITEX BREVILABIATA Ducke, Arquiv. Jard. Bot. Rio de Janeiro 4: 172. 1925.

Literature: Ducke, Arquiv. Jard. Bot. Rio de Janeiro 4: 172. 1925; Ducke, Notizbl. Bot. Gart. Berlin 11: 590--591. 1932; Moldenke, Geogr. Distrib. Avicenn. 26. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 102 (1942) and [ed. 2], 94 & 200. 1949; Occhioni, Lilloa 17: 485. 1949.

Low or medium-sized tree, to 12 m. tall; branchlets slender, gray, obtusely tetragonal, usually decidedly decussate-flattened, ampliate at the nodes, medullose, glabrate; twigs slender, short, flattened-tetragonal, densely short-pubescent with appressed-flavescent hairs; leaf-scars on older branchlets rather large and prominent; nodes not annulate; principal internodes 2--5 cm. long; leaves decussate-opposite, 3- or (usually) 5-foliolate; petioles slender, 1.5--4.7 cm. long, somewhat flattened above, densely short-pubescent or puberulent with flavescent hairs, not ampliate at the base; leaflets subequal in size when young, very unequal when mature, when 3 in number the two lateral ones are noticeably smaller, when 5 in number the two lowermost are much reduced, all rather long-petiolulate when mature; central petiole to 1 cm. long, the lateral ones shorter, all much shorter on immature leaves; leaflet-blades thin-membranous when immature, chartaceous when mature, rather uniformly dark-green on both surfaces, the central one elliptic or subobovate-elliptic, 3--8.5 cm. long, 1.4--4.5 cm. wide, obtusely rounded to a slightly acuminate apex, entire, rather long-acuminate or subacuminate at the base, puberulent on both surfaces when immature (especially on the midrib and secondaries), glabrate above when immature and very sparsely puberulent or pulverulent beneath; midrib slender, mostly flat or subimpressed above, prominent beneath; secondaries slender, 10--13 per side, ascending, arcuately joined close to the margins, conspicuously prominent beneath; vein and veinlet

reticulation fine, abundant, subprominent on both surfaces; inflorescence axillary, cymose, 2--7 cm. long, 1.5--5 cm. wide, dichotomously furcate one to three times with a terminal flower at each dichotomy, the cymes therefore 3--15-flowered, densely puberulent with flavescent hairs throughout, lax; peduncles 1--3.1 cm. long, flattened, often ampliate at the apex, flavescent-puberulent; inflorescence-branches conspicuously flattened, flavescent-puberulent, often ampliate at the apex; pedicels slender, 2--5 mm. long, those of the central flowers usually larger than the lateral ones or subobsolete; bracts none; bractlets 2 at each furcation, linear, 2--3 mm. long, flavescent-puberulent; prophylla minute, linear, about 1 mm. long; calyx campanulate-tubular, 3--4 mm. long, about 2 mm. wide, appressed-puberulent throughout, its rim mostly distinctly lobed, often somewhat zygomorphic, the lobes about 0.5 mm. long, more or less obtuse or rounded at the apex, to 1 mm. long after anthesis; corolla hypocrateriform, violet-blue or lilac, its tube broadly cylindrical, very slightly ampliate at the apex, 8--12 mm. long, very densely flavescent-puberulent on the outside, its limb short-lobed, the lobes subequal, much shorter than the tube, all about 3 mm. long, rounded at the apex, puberulent on both surfaces, the small lower lip short-bearded at the base inside; stamens and style somewhat exerted; fruiting-calyx and fruit not seen.

The type of this species was collected by Adolfo Ducke [Herb. Rio de Janeiro 13954] in elevated woody places around the lower cataracts at Villa Braga on the Rio Tapajoz, Pará, Brazil, on September 23, 1933, and is deposited in the herbarium of the Museu Nacional at Rio de Janeiro. The species inhabits virgin forests and non-inundated places in secondary woods and has been collected in anthesis in September, October, and December. Ducke states that it differs from V. duckei Huber in its slightly denser pubescence, its leaves being almost always 5-foliolate, the leaflets narrowed to the often rather long petiolule, the calyx almost tubular and always longer than the pedicel, and the lower lip of the corolla being much shorter than the corolla-tube. In the 1932 reference cited above he suggests that it may really be a hybrid between V. orinocensis H.B.K. and V. triflora Vahl. He says also that Herb. Rio de Janeiro 22529 has leaves much like those of V. triflora and flowers like those of V. brevilabiata. However, in my opinion this last-mentioned collection is typical V. klugii Moldenke, which see. He says that on the campos of the lower Amazon, where V. triflora and V. flavens H.B.K. grow side by side, one often finds specimens which seem to be hybrids between the two.

Citations: BRAZIL: Pará: Black 47-1659 (De--29379, N); Ducke s.n. [Herb. Rio de Janeiro 311; Macbride photos 17559] (B, F--663038--photo, Kr--photo, N--photo, N--photo, S--photo, W--1441532, Z--photo), s.n. [Herb. Rio de Janeiro 13954] (B--isotype, K--isotype, N--isotype, N--photo of isotype, P--isotype, S--isotype, Ut--isotype, W--1441630--isotype, X--isotype, Z--

photo of isotype).

VITEX BREVIPETIOLATA Moldenke, Geogr. Distrib. Avicenn. 26, nom. nud. (1939); Trop. Woods 64: 30--31. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 26. 1939; Moldenke, Alph. List Common Names 31. 1939; Moldenke, Trop. Woods 64: 30--31. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 102. 1942; Moldenke, Phytologia 2: 118. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94 & 200. 1949.

Shrub or tree; branches and branchlets slender, dark-gray, obtusely tetragonal, more or less densely gray-pubescent, glabrate in age; twigs very slender, short, very densely villous with spreading fulvous or ferruginous multicellular often gland-tipped hairs; nodes not annulate; principal internodes 1--6.5 cm. long; leaves clustered on the twigs only, decussate-opposite, 3-foliolate; petioles slender, 1--1.5 cm. long, very densely villous with spreading fulvous hairs like the twigs; leaflets sessile, firmly chartaceous, the central one elliptic or obovate-elliptic, 2.5--9 cm. long, 1.8--5 cm. wide, obtuse or acute at the apex (or obscurely subacuminate), entire, acute at the base, densely villous-tomentose on both surfaces, the pubescence grayish above and fulvous beneath, the lateral ones similar but smaller; midrib subimpressed above, prominent beneath; secondaries 8--10 per side, very slender, arcuate-ascending, anastomosing near the margins, very slightly subimpressed above and prominent beneath; vein and veinlet reticulation mostly hidden by the dense pubescence; inflorescence axillary, cymose; cymes opposite, several pairs on each twig, about 4 cm. long, few-flowered, surpassing the petioles; flowers not seen; fruiting-calyx cupuliform, 9--11 mm. long, 8--10 mm. wide, densely villous like the slender peduncles, pedicels, and twigs, its rim deeply 5-lobed, the lobes lanceolate, sharply acute, 4--6 mm. long; bractlets and prophylla linear, 2--8 mm. long, densely villous; fruit fleshy, drupaceous, oblong-elliptic, about 1 cm. long and 7 mm. wide, nigrescent in drying.

The type of this distinct species was collected by Bror Eric Dahlgren (no. 889) on the S. C. Johnson & Son Carnauba Expedition at Croatá, Ceará, Brazil, in 1935, and is deposited in the herbarium of the Chicago Natural History Museum. The word "ubaia" appears on the labels and probably represents a vernacular name for the plant.

Citations: BRAZIL: Ceará: Dahlgren 889 (F--841233--type, N--isotype, N--photo of type, Z--photo of type).

VITEX BUCHANANII J. G. Baker ex Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895.

Literature: J. G. Baker in Buchanan, Nyasaland Pl. 15. 1891; Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt-Dyer, Fl. Trop. Afr. 5: 319. 1900; Moore, Journ. Linn. Soc. Lond. Bot. 40: 168. 1911; Pieper in Engl., Bot. Jahrb. Beibl. 111: 42, 53--54, & 81. 1928; Moldenke, Known Geogr. Dis-

trib. Verbenac., [ed. 1], 51 & 102 (1942) and [ed. 2], 120 & 200. 1949. 1906.

Synonymy: Vitex buchanani Baker ex Dur., Ind.Kew.Suppl.1:456.

Shrub, about 6 m. tall; branches clothed with dense drab pubescence; leaves 5-foliolate, long-petiolate; leaflets oblong, usually acute at the apex, entire or obscurely dentate, cuneate at the base, pubescent on both surfaces, especially beneath, the central one 5--7.5 cm. long, distinctly petiolulate; cymes forming an ample thyrsoid panicle, with densely pubescent branches; calyx campanulate, about 1 mm. long, the teeth small, deltoid; corolla-tube cylindric, less than 2 mm. long, its lobes small, orbicular; stamens not protruding beyond the corolla-lobes.

The species is based on Buchanan 782 from Nyasaland, Other collections cited by Baker, Pieper, and Moore are Buchanan 318 and 385 from Nyasaland, Whyte s.n. from Mount Malosa, Nyasaland, Whyte s.n. from the plains of Zomba, Nyasaland, and Moore 1053 from lower Buzi, Gazaland, Portuguese East Africa. The species has been found at altitudes of from 2500 to 6000 feet.

Citations: TANGANYIKA TERRITORY: Schlieben 1614 (N, N--photo, S, Z--photo).

VITEX BUCHANANII var. QUADRANGULA (Gürke) Pieper in Engl., Bot. Jahrb. Beibl. 141: 54 [as "buchanani"]. 1928.

Literature: Gürke in Engl., Bot. Jahrb. 28: 463-4. 1900; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 520. 1900; Pieper in Engl., Bot. Jahrb. Beibl. 141: 54 & 81. 1928; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac. [ed. 1], 50 & 102 (1942) and [ed. 2], 117 & 200. 1949.

Synonymy: Vitex quadrangulus Gürke in Engl., Bot. Jahrb. 28: 463--464. 1900. V. quadrangula Gürke ex Thiselt.-Dyer, l.c. 1900.

The variety differs from the typical form of the species in its mostly larger leaves and more strongly developed inflorescences.

Pieper asserts that this plant can be no more than a variety of V. buchanani, and with this statement I agree heartily. The actual size of the leaflets cannot be used as a specific character to separate the two taxa because in the variety the leaflets actually vary from quite large to quite small on the same specimen. Actually, the Stolz collection cited below shows characters that are intermediate between those given by Baker for V. buchanani and those ascribed by Gürke to V. quadrangula -- its pubescence is that of the former, while its inflorescence form is that of the latter.

The variety has been collected at 1800 meters altitude and is based on Goetze 157 from South Uluguru, Tanganyika Territory.

Citations: BRITISH NYASALAND PROTECTORATE: Stolz 512 (N, N--photo, S, Z, Z--photo).

VITEX BUCHNERI Gürke in Engl., Bot. Jahrb. 18: 166. 1894.

Literature: Engl., Bot. Jahrb. 18: 166. 1894; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 331. 1900; Durand, Syll. Fl.

Congol. 436. 1909; Pieper in Engl., Bot. Jahrb. Beibl. 141: 45, 58, & 81. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49, 51, & 102 (1942) and [ed. 2], 115, 119, & 200. 1949.

A shrub; branches finely tomentose on the younger parts; leaves 5-foliolate, long-petiolate; leaflets obovate, 10--13 cm. long, short-cuspidate at the apex, narrowed to the base, pubescent above, densely ferruginous-tomentose beneath, very shortly petiolulate; cymes axillary, long-stalked, lax, the branches ferruginous-tomentose; pedicels elongate; lower bracts lanceolate; calyx campanulate, about 2 mm. long, the teeth lanceolate-deltoid and acute; corolla-tube slightly longer than the calyx, the axial lobe cuneate and deeply dentate; stamens short-exserted.

The species is based on Buchner 574 from Kassambo, Angola. Pieper also cites a Durand collection from Belgian Congo.

VITEX BUDDINGII Moldenke, Phytologia 4: 59--60. 1952.

Tree, 25--28 m. tall, 16--21 m. to the lowest branch; trunk diameter at breast height 45--50 cm., at first branch 31--35 cm.; branches tetragonal, nigrescent in drying, rather densely fulvous-tomentellous; principal internodes apparently abbreviated; nodes annulate; leaves decussate-opposite, 5-foliolate; petioles slender or stout, often collapsing and flattened in drying, 7.5--13 cm. long (immature), densely puberulent with cinereous or fulvous hair; petiolules slender, 2--7 mm. long (immature), rather densely puberulent; immature leaflet-blades membranous, nigrescent in drying, somewhat lighter beneath, narrow-elliptic, approximately equal in size, 4.5--7 cm. long, 1.5--2.1 cm. wide, more or less crenulate-margined, acute at the apex and base, densely lepidote on both surfaces, more or less puberulent beneath, especially on the larger venation, glabrescent above; midrib slender, prominent beneath; secondaries very slender, numerous, close together, 15--13 per side, divergent-ascending, not arcuate, not anastomosing, prominulous beneath, indiscernible above; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, paniculate, rather densely fulvous-tomentellous throughout, densely many-flowered, apparently to about 15 cm. long and 4 cm. wide; peduncles to about 3 cm. long, puberulent with fulvous hairs, nigrescent; sympodia and inflorescence-branches densely fulvous-tomentellous, often compressed; bractlets lanceolate, 1--3 mm. long, often recurved, glabrate and nigrescent above, densely fulvous-tomentellous beneath, densely ciliate-margined; pedicels slender, about 1 mm. long, densely fulvous-tomentellous; calyx campanulate, about 2 mm. long, densely fulvous-tomentellous, its rim 4-apiculate; corolla and fruit not known.

The type of this species was collected by I. F. Ch. Budding (no. 227) -- in whose honor it is named -- at Melawi, western Borneo, at an altitude of 130 meters, on March 3, 1939, and is deposited in the Herbarium Bogoriense at Buitenzorg. The species is apparently related to V. urceolata C. B. Clarke and V. erioclona H. J. Lam, as is obvious from the type of inflorescence.

Citations: BORNEO: Budding 227 [Boschbouwproefstation bb. 27010] (Bz--25440--type, N--photo of type, Z--photo of type); Zwaan 1107 [Boschbouwproefstation bb.19065] (Bz--25443, N).

VITEX BULUSANENSIS Elm., Leaf1. Philipp. Bot. 10: 3798. 1939.

Literature: Elm., Leaf1. Philipp. Bot. 10: 3798. 1939; Hill & Salisbury, Ind. Kew. Suppl. 10: 244. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 142 & 200. 1949.

Citations: PHILIPPINE ISLANDS: Luzon: A. D. E. Elmer 17004 (Du--175038--isotype, N--isotype, N--photo of isotype, S--isotype, Ut--66380--isotype, Z--photo of isotype).

VITEX CAESPITOSA Exell, Journ. Bot. 69: Suppl. 2: 145. 1931.

Literature: Exell, Journ. Bot. 69: Suppl. 2: 145. 1931; Hill, Ind. Kew. Suppl. 9: 297. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 102 (1942) and [ed. 2], 119 & 200. 1949.

I know nothing about this species except that it is supposed to be native to Angola.

VITEX CALOTHYRSA Sandw., Kew Bull. 1930: 157--158. 1930.

Literature: Sandw., Kew Bull. 1930: 157--158. 1930; Ducke, Anais de Prim. Reun. Sul-Amer. Bot. 3: 398. 1938; Moldenke, Geogr. Distrib. Avicenn. 20 & 26. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32, 39, & 102. 1942; Moldenke, Phytologia 2: 118. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65, 94, & 200. 1949.

Synonymy: Vitex pacimonensis Spruce ex Sandw., Kew Bull. 1930: 158, in syn. 1930.

Small or medium-sized tree, to 30 m. tall; branches and branchlets rather stout, very medullose, obtusely tetragonal, purplish-brown, decidedly lenticellate with narrow elongate light buff-colored lenticels, finely and rather sparsely puberulent (more densely so at the nodes), becoming subglabrate in age; bark brown, rough; nodes distinctly annulate with a U-shaped annulation; principal internodes 2--8.5 cm. long; leaves decussate-opposite, 3-foliolate; petioles stout, 2.5--6 cm. long, convex beneath, conspicuously flattened above, sparsely and minutely puberulent or glabrate, nigrescent in drying, somewhat thickened at the base; leaflets subequal in size or the lateral ones somewhat smaller, all conspicuously petiolulate, the petiolules stout, 5--9 mm. long, and similar to the petiole in all respects, often widely margined and canaliculate above; leaflet-blades coriaceous, uniformly dark gray-green on both surfaces, very shiny and lustrous, the central one elliptic, 7.8--18.7 cm. long, 4--8.4 cm. wide, rather long-acuminate at the apex, rounded or obtuse at the base, entire, glabrous on both surfaces [except for a slight pulverulence along the midrib]; midrib stout, flat or subimpressed above, prominent and often sharply keeled beneath; secondaries slender, 7--15 per side, irregular, arcuate-ascending, the upper ones usually joined near the margins but the lower ones not joined, mostly flat above, prominent beneath;

vein and veinlet reticulation rather sparse, often obscure above and only the largest portions slightly prominulous beneath; inflorescence mostly terminal (or a pair of simple panicles in the uppermost axils), thyrsoid-paniculate, massive, 20--36 cm. long, 5--17 cm. wide (or probably much wider when fresh), composed of 1--3 pairs of opposite panicles, each of which is made up of 3--10 pairs of opposite subsessile cymes, each cyme rather many-flowered; peduncle (2--5 cm. long) and rachis stout, tetragonal-flattened, medullose, purplish, more densely puberulent than the branchlets (especially at the nodes), annulate at the nodes; sympodia usually greatly elongate, the lateral panicles long-stalked; pedicels 1--3 mm. long, densely short-pubescent; bracts small, usually subtending each pair of panicles, mostly deeply 3-laciniate or 3-lobed, 5--9 mm. long, densely short-pubescent with silky hairs; bractlets and prophylla small, linear or setaceous, 1--2 mm. long, densely short-pubescent; flowers odorous; calyx campanulate, grayish, 1.5--2.5 mm. long, 2--4 mm. wide, more or less densely pubescent outside, nigrescent beneath the pubescence, nigrescent and subglabrous on the inner surface, its rim short-toothed, the teeth often inconspicuous, broadly triangular, 0.5--1 mm. long, to 1.5 mm. wide; corolla blue, blue-violet, or "yellow" [ex Froes], its tube 7--9 mm. long, ampliate to about 3 mm. at the apex, the lowest one-third nigrescent and glabrous, the remainder very densely pubescent, subglabrous or sparsely pilose within, the throat pilose, the lobes bright-blue, minutely velutinous-tomentellous within, the smaller ones about 4 mm. long and 3.5 mm. wide, the large anterior one to 7 mm. long and 5 mm. wide; stamens inserted about 2 mm. above the base of the corolla-tube, the longer ones 7 mm. long, the shorter ones 6 mm. long; filaments white, densely pubescent toward the base, sparsely hispidulous or glabrescent above; anthers blue; style about 8 mm. long, hispidulous, its lobes subulate, about 0.5 mm. long, glabrous; ovary subglobose, to 1.5 mm. long and wide, the upper half very densely pubescent, the lower half nigrescent and subglabrous; fruiting-pedicels incrassate, about 3 mm. long, densely puberulent; fruiting-calyx subpatelliform, about 2 mm. long, 5--6 mm. wide, undulate or obscurely lobed or split, widely divergent from the fruit, sparsely puberulent on the outside; fruit drupaceous, fleshy, obovate or subglobose, 6--13 mm. long, 6--12 mm. wide, glabrous.

The type of this species was collected by Richard Spruce (no. 3356) on the banks of the Río Pacimoni in Bolívar, Venezuela, in February, 1854, and is deposited at Kew. The species grows on low or inundated land along forested river banks and in terra firma woods, to an altitude of 125 meters, and has been collected in anthesis from February to April and in June and October. The only common name recorded is "tarumá". The Schomburgk specimens cited below have labels in some herbaria reading "British Guiana", but according to Sandwith, these labels are in error; the collection was made along the Río Padawiri (Padauriy) near its confluence with the Río Negro in Amazonas, Brazil, in March, 1839. Its leaflets are somewhat broader than those seen on the type collection.